Vol. 33, No. 8 *PSYCHOLOGICAL REVIEW PUBLICATIONS* October, 1936

Psychological Bulletin

CONTENTS

PUBLISHED MONTHLY (EXCEPT AUGUST AND SEPTEMBER)
FOR THE AMERICAN PSYCHOLOGICAL ASSOCIATION
BY THE PSYCHOLOGICAL REVIEW COMPANY
PRINCETON, N. J.

Entered as second-class matter at the post-office at Princeton, N. J., with an additional entry at Albany, N. Y.

Publications of the American Psychological Association

Vol. 33, No. 8 October, 1936

THE
PSYCHOLOGICAL BULLETIN

PAVLOV'S CONTRIBUTION TO PSYCHOLOGY

H. S. LIDDELL
Department of Physiology and Biochemistry,
Cornell University Medical College, Ithaca, N. Y.

The close of Professor Ivan Petrovich Pavlov's long and distinguished career may be regarded as coinciding with the end of an exciting epoch in the history of American psychology—an epoch characterized by the rise of behaviorism. The publication of Thorndike's *Animal Intelligence* in 1898, followed by the fundamental experimental studies of animal behavior of Carr, Yerkes and others, prepared the way for Watson's dramatic statement of the standpoint of the behaviorist in his eight lectures given at Columbia University during the winter of 1913.

Ten years earlier Pavlov had given an address before the International Congress of Medicine at Madrid on "Experimental Psychology and Psychopathology in Animals." In this remarkable lecture he formulated for the first time his concepts of the conditioned and unconditioned reflex and stated clearly his view of psychology in its relation to physiology.

Pavlov's contribution to psychology can best be understood with reference to the behaviorist movement. For this reason it is necessary to compare his first statement regarding "the objective study of the higher nervous activity [behavior] of animals" with Watson's challenge to the introspective psychologists (structuralists and functionalists) of 1913.

Pavlov says:[1] "To understand these phenomena [of psychical secretion] are we obliged to enter into the inner state of the animal, to fancy his feelings and wishes as based on our own?

[1] Pavlov, I. P., *Lectures on Conditioned Reflexes* (Trans. by W. Horsley Gantt). New York: International Publishers, 1928. P. 50.

"For the investigator, I believe there is only one possible answer to the last question—an absolute 'No.' Where does there exist so incontestable a criterion that one may judge by it, and may use it in understanding the internal state of an animal by comparison with our own, even though the animal be so highly developed as the dog? And further: does not the eternal sorrow of life consist in the fact that human beings cannot understand one another, that one person cannot enter into the internal state of another? Where is that knowledge, where is the understanding that might enable us to know correctly the state of our fellow man? In our 'psychical' experiments on the salivary glands (we shall provisionally use the word 'psychical'), at first we honestly endeavored to explain our results by fancying the subjective condition of the animal. But nothing came of it except unsuccessful controversies, and individual, personal, incoördinated opinions. We had no alternative but to place the investigation on a purely objective basis. The first and most important task before us, then, is to abandon entirely the natural inclination to transpose our own subjective condition upon the mechanism of the reaction of the experimental animal, and instead, to concentrate our whole attention upon the investigation of the correlation between the external phenomena and the reaction of the organism, which in our case is the salivary secretion. Reality must decide whether the elaboration of these new phenomena is possible in this direction."

Watson says:[2] "Human psychology has failed to make good its claim as a natural science. Due to a mistaken notion that its fields of facts are conscious phenomena and that introspection is the only direct method of ascertaining these facts, it has enmeshed itself in a series of speculative questions which, while fundamental to its present tenets, are not open to experimental treatment. In the pursuit of answers to these questions, it has become further and further divorced from contact with problems which vitally concern human interest.

"Psychology, as the behaviorist views it, is a purely objective, experimental branch of natural science which needs introspection as little as do the sciences of chemistry and physics. It is granted that the behavior of animals can be investigated without appeal to consciousness. Heretofore the viewpoint has been that such data

[2] Watson, John B., *Behavior; An Introduction to Comparative Psychology.* New York: Henry Holt and Co., 1914. P. 26 f.

have value only in so far as they can be interpreted by analogy in terms of consciousness. The position is taken here that the behavior of man and the behavior of animals must be considered on the same plane; as being equally essential to a general understanding of behavior. It can dispense with consciousness in a psychological sense. The separate observation of 'states of consciousness' is, on this assumption, no more a part of the task of the psychologist than of the physicist."

In spite of this striking similarity in point of view the experimental work of Pavlov and his colleagues and that of the American behaviorists developed independently of one another. It was not until after the Russian revolution that effective contacts were established between Pavlov's laboratories and American laboratories of animal behavior, but meanwhile the publication in English of Pavlov's two volumes on conditioned reflexes[3] led, in this country, to widespread discussion of the status of the conditioned reflex in relation to the various theories of learning.

Before attempting to assess the importance of the conditioned reflex in American psychology of today it will be useful to sketch the biography of Pavlov's scientific thinking. From this sketch it is hoped that the unique contribution which he has made to psychology will appear. It is needless to dwell upon the details of his education and academic career. In brief, they are as follows:

He was born in Ryazan, a peasant town in central Russia, on September 26, 1849. After study in a church school he entered the theological seminary in Ryazan but, deciding against a theological career, discontinued his studies to enter the University of St. Petersburg in 1870. Attracted by the brilliant experimental demonstrations of the physiologist Elie Tyson he selected physiology as his major subject in 1874 and was awarded a medal for an investigation of the innervation of the pancreas. After graduation from the Military Medical Academy he was licensed to practice medicine in 1879. A fellowship permitted him to complete his dissertation for the degree of Doctor of Medicine in 1883.

During the years 1884–86 he studied with the physiologists Ludwig and Heidenhain. Returning to St. Petersburg he became assistant to a famous Russian clinician, S. P. Botkin. Pavlov's task

[3] Pavlov, I. P., *Lectures on Conditioned Reflexes* (Trans. by W. Horsley Gantt). New York: International Publishers, 1928. *Conditioned Reflexes: An Investigation of the Physiological Activity of the Cerebral Cortex* (Trans. by G. V. Anrep). Oxford: Oxford University Press, 1927.

was to engage in experiments upon animals, the results from which were clinically interpreted and applied by Botkin. Although the animal laboratory was nominally under the direction of Botkin, Pavlov was actually in complete charge of the investigations. The direct consequence of this new freedom for independent research was Pavlov's classical experiments on sham feeding.[4] From his interpretation of the effect of sham feeding upon the secretion of gastric juice germinated his later views concerning the higher nervous activity (or behavior) of the dog and of man.

Pavlov wrote as follows:[5] "The dog eats with greed before one's eyes, the food which it receives is pleasant, it not only imagines food but actually eats it, and has therefore no reason to feel offended, for naturally the idea does not occur to any of the dogs that all their trouble is in vain.

"Consequently, in the sham feeding experiment, by the act of eating, the excitation of the nerves of the gastric glands depends upon a psychical factor which has here grown into a physiological one, that is to say, is just as much a matter of course, and appears quite as regularly under given conditions as any other physiological result. Regarded from the purely physiological side, the process may be said to be a complicated reflex act. Its complexity arises from this, that the ultimate object is attained by the joint working of many separate organic functions. The material to be digested—the food—is only found outside the organism in the surrounding world. It is acquired

[4] Pavlov describes the sham feeding of the dog as follows: "It [the dog] possesses an ordinary gastric fistula with metallic cannula, and has had its oesophagus divided as well, so that the mouth is cut off from all communication with the cavity of the stomach. Its stomach has been washed out before the beginning of the lecture, and, as you see now, not a single drop of fluid escapes from the fistula. I give the dog food. The animal eats greedily, but the whole of the food swallowed comes out again at the eosophageal opening in the neck. After feeding in this way (which for shortness we will henceforth name 'sham feeding') for five minutes, perfectly pure gastric juice makes its appearance at the fistula, the stream steadily becomes greater and greater, and now, five minutes after the commencement of secretion, we have already 20 c.c. of juice. We may continue to feed the dog as long as we wish, the secretion will flow at the same rate for one, two, or more hours. We have even had dogs so greedy that they did not tire of eating in this fashion for five or six hours, secreting during the time a total quantity of up to 700 c.c. of the purest gastric juice." (*Work of the Digestive Glands*, p. 50.)

[5] Pavlov, I. P., *The Work of Digestive Glands* (Trans. by W. H. Thompson). London: Charles Griffin and Company, 1902. P. 74 f.

not alone by the exercise of muscular force, but also by the intervention of higher functions, such as judgment, will, desire. Hence the simultaneous excitation of the different sense organs, of sight, of hearing, of smell and taste, is the first and strongest impulse towards the activity of the gastric glands. This especially applies to the two latter senses, since they are excited only when the food has already entered the organism or at least has arrived very near it. It is by the establishment of this passionate desire for eating that unerring and untiring nature has linked the seeking and finding of food, with the commencement of the work of digestion. That this factor, which we have now carefully analysed, stands in closest connection with an everyday phenomenon of human life, namely, appetite, may easily be predicated. This agency, which is so important to life and so full of mystery to science, becomes here at length incorporated into flesh and blood, *transformed from a subjective sensation into a concrete factor of the physiological laboratory.*" (Italics ours.)

In 1890 he was elected Professor of Pharmacology in the Military Medical Academy of St. Petersburg and in 1895, Professor of Physiology in the same institution. Then in 1891 the Prince of Oldenburg founded the Institute of Experimental Medicine and provided funds for the construction, under Pavlov's direction, of a surgical ward for dogs. In this excellent hospital it was possible for him to perform those delicate surgical operations on the digestive organs which enabled him to study in healthy dogs the minute details of the work of the digestive glands. For this meticulous investigation he was awarded the Nobel Prize in 1904.

By 1906, however, he had turned aside from the study of digestion to engage in the task of investigating the work of the brain. But there was no radical change either in his method or in his viewpoint. In his study of gastric secretion "appetite" was found to produce "juice." The complex bodily operations represented by the word "appetite" he now proposed experimentally to analyze by observing the activity of the simplest and most easily isolated juice-producing organ, the parotid gland.

Pavlov's utilization of the secretory rather than the motor response in the experimental analysis of conditioned reflex action has both puzzled and antagonized American psychologists. His decision to ignore the motor activity of the animal was, however, the consequence of serious reflection rather than of the inertia of laboratory

habit, as the following quotations show. They are chronologically arranged with the date preceding the quotation.

1903. "For the successful investigation of such a complicated subject it is important that it be in some way simplified. By our methods this simplification can be obtained. The rôle of the salivary glands is so evident that their relation to the organism must also be simple and easily available for investigation. One must not conclude, however, that all the services of the salivary glands are contained in their elementary function. By no means. Saliva is used by the animal, for example, to lick and promote healing of its wounds, as we constantly see. That is why we may obtain varieties of saliva from the stimulation of several afferent, centripetal nerves. But the complexity of the reaction of the salivary glands is much less than that of skeletal muscle; through the latter reactions, the organism is entangled with the outer world in an endless number of ways. Furthermore, the simultaneous comparison of the glandular (in particular the salivary) reaction with the motor will give us the possibility, on the one hand, of differentiating the special points from the general ones, and, on the other hand, of getting rid of the *habitual and routine anthropomorphic conceptions and explanations which we have accumulated and which confuse our understanding of the motor reaction of animals.*" (*Lectures,* p. 58; italics ours.)

1909. "Our entire work, up to the present, has been performed exclusively on a physiologically unimportant organ, the salivary gland. This choice, although at first accidental, proved in our further work to be a serviceable and happy one. Above all, it satisfied a fundamental demand in scientific thinking, *i.e.* to begin with the simplest case; and, secondly, in this organ it was easy to distinguish between simple and complex forms of nervous activity, so that they could be readily separated for study." (*Lectures,* p. 124.)

1910. "How is the activity of the food centre manifested? It is manifested in the exercise of the whole skeletal musculature, when it directs the body of the animal to the nutritive object, and also in the activity of that part of the skeletal musculature which transfers the food from the outside world to the digestive tract. The food centre sets into activity the upper secretory parts of the digestive canal, especially the salivary and gastric glands, simultaneously with the stimulation of certain movements of the skeletal musculature. These two different functions, the secretory and the muscular, are excited by the food centre in a parallel manner, so that

by following the activity of one of these functions the experimenter can judge of the activity of the other. Consequently, the work of the salivary glands as studied in the conditioned reflexes is closely connected with the manifestations of the activity of the food centre. By limiting our observations to its secretory activity we lose nothing, but on the other hand, we gain in exactness and clearness; for the skeletal muscles serve other masters besides the food centre, and therefore their phenomena are very complicated. The gastric glands are deeply situated, and their activity is not directly and exclusively dependent on this centre but is also conditioned by some other internal stimulations. Only the salivary glands serve as a special representative of the activity of the food centre." (*Lectures,* pp. 147–148.)

Commenting upon the methods employed in animal psychology he says:

1913. "The methods for the examination of the higher nervous activity of the animal which psychology has originated—the learning of labyrinths, the opening of various contrivances, etc.—certainly lead to the collection of scientifically useful material, but material which consists of separate fragments, and which does not bring us nearer to the fundamentals, the elements of nervous phenomena because it must be itself analysed and explained." (*Lectures,* p. 237.)

We may suppose that American behaviorists turned so soon from experimentation to argumentation for the very reason that they were psychologists and were, therefore, professionally addicted to an absorbing interest in movement and posture. One remembers the tremendous importance which Watson attached to speech habits and to implicit behavior and the time-consuming arguments which these two notions precipitated.

What is Pavlov's contribution to psychology? The best answer one can give is to say that he has strongly motivated many young psychologists to familiarize themselves with the structure of the body and with its simpler operations as a preparation for the arduous task of analyzing those highly complex functions which are traditionally regarded as psychical. Older American psychologists can look to the future with confidence when they see the new members of the profession mastering the difficult techniques of neurosurgery and electrophysiology in preparation for psychological research. Pavlov has contributed to psychology indirectly through his growing influence on physiology. Today there are a number of conditioned

reflex laboratories in departments of physiology in this country and the training of animals for chronic experiments in neurophysiology is no longer regarded as a sacrifice of time.

It is perhaps directly due to Pavlov's example that the physiology of the living mammalian corpse, the narcotized or decapitated animal preparation of classical physiology, is viewed with increasing suspicion as a means of discovering facts of use in the practice of medicine. Of the significance or importance of his conditioned reflex theory in psychology little need be said. For years it has provided behaviorists with a set of convenient blackboard schemata for classroom use. It has taken its place as one theory of the "learning process" amongst others. Pavlov said that he entered the field of conditioned reflex action "under the influence of a powerful laboratory impression" and in his first lecture on the subject he began as follows: "Esteeming the language of facts as the most eloquent, I ask your attention to the experimental material which gives me the right to speak on today's subject." If those psychologists who oppose Pavlov's theory argue with the language of new facts the conditioned reflex will have served its purpose in the development of the science.

PROCEEDINGS OF THE SEVENTH SPRING MEETING, EASTERN BRANCH, AMERICAN PSYCHOLOGICAL ASSOCIATION

HERBERT W. ROGERS, SECRETARY-TREASURER, LAFAYETTE COLLEGE

The Seventh Annual Spring Meeting of the Eastern Branch of the American Psychological Association was held on Saturday, April 11, 1936, at Fordham University, New York City. It was attended by approximately 300 persons. Of those who attended and also registered, 155 were members or associates and 111 were guests.

The papers presented in the scientific program were arranged in 6 sections: Physiological Psychology, Child and Abnormal Psychology, Memory and Learning, Sensation and Perception, Comparative Psychology, and Mental Testing. A Round Table Conference on Introspective Techniques was held under the direction of E. S. Robinson, Yale University.

At the business meeting it was voted to change the name of the "New York Branch of the American Psychological Association" to the "Eastern Branch of the American Psychological Association."

Elections: Honorary President, 1936–1937, Samuel W. Fernberger, University of Pennsylvania; *Board of Directors:* D. H. Fryer, New York University, 1936–1939; C. J. Warden, Columbia University, 1936–1939; P. M. Symonds, Teachers College, Columbia University, 1936–1938.

Committees Appointed: Program: C. W. Bray, Princeton University, Chairman; G. W. Hartmann, Pennsylvania State College; T. W. Forbes, New York State Psychiatric Institute. *Nominating:* H. Helson, Bryn Mawr, Chairman; T. M. Abel, Progressive Education Association; I. Lorge, Teachers College, Columbia University.

Next Meeting: The invitation to hold the next Annual Spring Meeting at Vassar College, Poughkeepsie, New York, was voted accepted.

At the dinner, the retiring Honorary President, Herbert S. Langfeld, Princeton, spoke on *The Place of Aesthetics in Social Psychology.*

Abstracts of the papers presented follow:

Sensation and Perception

Chairman, S. W. Fernberger
University of Pennsylvania

Adaptation in Isolated Cold Spots. William L. Jenkins, Lehigh University.

Classical theories of temperature sensitivity have been based primarily upon the phenomena of adaptation. These, however, seem to have been determined systematically only for areas of several square cm. or larger. When single cold spots were subjected to pure thermal stimulation (with tactile eliminated), it was found that complete adaptation took place in a median time of less than 4 seconds. Such adaptation times are manifestly of a different order of magnitude from those found for larger areas. Following even the briefest stimulation of a cold spot by a low temperature, moreover, there was a marked depression of the liminal temperature (*i.e.* the highest temperature to which the cold spot will respond). Temporary restoration could be effected by a one-minute contact with a high temperature or, less certainly, by periods of non-stimulation lasting from 2 to 5 minutes. Slowly raising or lowering the temperature of the skin area surrounding the cold spot also brought about changes in liminal temperature which are not readily explainable in terms of the older theories. A working hypothesis which postulates a reversible reaction (A-B) plus the presence of a necessary third substance (C) is proposed as a basis for further critical research.

Form Perception in the Thermal Sense-Modalities. L. J. Stone, Columbia University.

This experiment forms part of a program of research with 2 major aims. (1) Is it possible to perceive patterns by way of the temperature senses? (2) If so, what are the laws governing such perception: specifically, do they correspond to the laws of visual form perception laid down by Koffka, Wertheimer, and others of the Gestalt school?

Experiments using as stimuli cooled or heated copper forms (disk, triangle, rectangle)—surrounded by hard-rubber disks to eliminate pressure cues—have been carried out to determine to what extent temperature experiences may be "formed." The results

indicate that patterns are reported (possibly because of the instructions given the subject) but with little or no objective accuracy. A new apparatus is planned, employing radiant heat, which, it is hoped, will eliminate the masking effect of pressure.

The experimental situation in the work here reported corresponds to one described by Koffka for vision, where the "outer" (stimulus) forces are weak and the "inner" (central nervous system) forces relatively "strong." Under such conditions Koffka predicts certain results; these predictions are partially fulfilled and partially contradicted. If the laws of "Prägnanz," closure, etc. are truly those of the central nervous system they should be demonstrable in other than visual sense-modalities.

Further experiments are planned with the new apparatus which should give a more definite answer to question (1), and by means of which crucial experiments to test the Gestalt predictions may be set up. It is also hoped to carry out some training experiments which may throw light on the process of development of perception in all sense modalities.

The Prediction and Control of Vexirfehler *in the Determination of the Two-Point Threshold.* HARRY HELSON, Bryn Mawr College.

Judgments of two from zero separation have been regarded as anomalous or wrong and have often been used as a basis for the rejection of data in the determination of the two-point threshold. No definite, quantitative criteria have yet been proposed by which the number of such judgments may be judged as excessive. Consideration of the phi-gamma hypothesis shows that on purely *a priori* grounds the number of two judgments from single-point stimulation should vary directly with the magnitude of the limen and inversely with the measure of precision (h). This obvious deduction from the general psychometric theory runs counter to the statements regarding the occurrence of *Vexirfehler* but is substantiated by experimental results both of the author and of data published by others.

Extrapolation to zero separation, both when the percentages for zero separation are included in the computations of L and h, and when they are omitted, gives excellent agreement between theory and data from different parts of the body. The theory also provides for those cases where more twos should have been reported than are actually found—a possibility hitherto neglected. The use of single-point stimulation is recommended because: (1) it is the best

stimulus by which the subject can learn 'oneness' in preliminary experimentation; (2) departures from expectation in the case of this stimulus are very significant; (3) the steadying effect of a 'real' one-point stimulus makes for better judgments on all the other stimuli.

Judgment and Discriminatory Analysis. JOHN VOLKMANN, Harvard University.

In order to meet its tasks of adaptation to the environment, an organism must perform various degrees of discriminatory analysis. In principle, the biological requirement is the following: to one class of events a given response must be made, and to an adjacent class there must be made a different response or no response at all. The degrees of analysis appear clearly in psychophysical experiments which employ the absolute judgment. In addition, certain quantitative regularities in the field of judgment show how adaptable and how complete discriminatory analysis can be.

The first stage of analysis comprises the response to a single object or stimulus-situation out of a number of them. For example, the observer in an auditory experiment attends to a tone in a pair of head-phones. The second stage of analysis comprises the response to a single characteristic of the object; the observer responds to the stimulus-correlates of pitch, for example, rather than those of loudness, volume, or density. The third stage comprises response to stimulus-level, to the central value of the group of stimuli presented. As this central value shifts up and down the stimulus-continuum, the center of the absolute scale moves with it. Experimental material from the judgment of visual inclinations and kinesthetic extents illustrates this point. The fourth stage comprises response to stimulus-range. As the group of stimuli offered expands and contracts, the width of the absolute categories or scale-steps expands and contracts in proportion. The experimental results are derived from judgment of visual inclinations and lengths of lines visually presented.

Discriminatory analysis is capable of a further variation: it can be made coarse or fine by varying the number of possible responses. In the psychophysical situation, this means varying the number of categories of judgment. The results show that as the number of categories is reduced, the width of the categories decreases in a regular manner.

Intra-Serial Effects and Psychophysical Judgments. MALCOLM G. PRESTON, University of Pennsylvania.

This experiment was undertaken to investigate the intra-serial effects to be observed among judgments obtained by using the method of constant stimuli. The subjects compared pairs of weights, objectively equal, reporting whether the second was lighter, equal or heavier than the first. Using experimental and statistical techniques devised by Arons and Irwin in an earlier experiment, the following matters were studied:

1. Intra-serial effects between proximate judgments.

2. Intra-serial effects between judgments with 1, 2, and 3 judgments interposed.

3. Intra-serial effects between judgments with silent periods of 8 and 16 beats of the metronome (beating at 92 per minute) interposed.

4. Effects upon the psychometric functions obtained from the comparison of a series composed of comparison weights of 84, 88, 92, 96, 100, 104, and 108 grams with a standard weight of 100 grams, when each of these comparisons follows the judging of a pair of equal weights of 100 grams.

The results are compared with those of Arons and Irwin, Turner, and Fernberger. It appears that the intra-serial effects present in psychophysical experimentation cannot be referred to stimulus conditions alone and are not related to the time-error. They may be interpreted as meaning that the subject is constantly disposed to report the comparison weight to be greater than the standard weight.

Asymmetries in Judgments on Visually Perceived Figures. FRANCIS W. IRWIN and MORTON A. SEIDENFELD, University of Pennsylvania.

In the past, two important sets of problems have been treated experimentally in a way which fails to bring to light the possible relations between them: namely, the problems of changes in memory with the passage of time, as represented by the well-known work of F. Wulf; and the problems of the time-error in psychophysical judgments. The authors have attempted a rapprochement between these two sets of problems by having subjects make judgments upon certain aspects of visually perceived figures at various time intervals after the original exposure of the figures. These judgments can be treated in a manner formally identical with that used in studying

the psychophysical time-error; but the appearance of very definite asymmetries in their distribution lends itself to possible interpretation in terms of memory changes.

The Magnitude and Temporal Course of Facilitation of Hearing by Vision. IRVIN CHILD and G. R. WENDT, Yale University.

This study is concerned with the influence of a flash of light upon the audibility threshold for an accompanying tone when the time interval between the onset of light and tone was varied. The visual stimulus was a two-degree circular patch at approximately 50 apparent foot-candles. Its duration was 0.1 second. The sound stimulus was a 1000 d.v. tone of 0.165 second duration. Its intensity in any trial was one of 5 intensities separated by 2 decibel steps, lying some above and some below the threshold of hearing. The subject was in a darkened sound-shielded room. Stimulations were separated by 15 seconds. A ready signal occurred 7.6 seconds before the onset of tone. Each of 10 subjects made 60 judgments with each of 5 time intervals between light and tone, 60 judgments with light presented alone, and 100 judgments with tone presented alone, the presentations being made in a random order of sound intensities and of relationships between light and tone. The influence of the light was indicated by the increment (or decrement) in frequency of reports of tone when the tone and light were presented together in different time relationships as compared to those trials when the tone was presented alone. The findings were: (1) On the average the frequency of reports of tone showed the greatest increase when the light preceded tone by 0.5 second, a lesser increase when they were simultaneous or when light preceded tone by 1.0 second, a still smaller increase when light followed tone by 0.5 second, and no increase when light preceded tone by 2.0 seconds. (2) The maximum magnitude of the increase was in general small. It varied for different subjects from nearly zero to an increase resulting in a threshold shift of about 2 decibels.

COMPARATIVE PSYCHOLOGY

CHAIRMAN, L. CARMICHAEL
Brown University

The Development of Visual Acuity in Kittens. JOHN WARKENTIN, Brown University. (Introduced by L. Carmichael, Brown University.)

In this study an attempt has been made to ascertain the appearance and development of pattern vision in kittens by means of a method which elicited compensatory movements of the head and eyes in the direction of a rotating striated pattern.

A cylinder, 105 cm. high and 120 cm. in diameter, was constructed so that it could be rotated on its base independently of the animal, when the latter was placed on a small stationary platform on the inside of the cylinder. The cylinder consisted of a wooden framework that was lined on its side and bottom with white oilcloth, against which black stripes of cardboard of varying widths could be inserted. By adjusting the position of the platform, which was suspended from the ceiling by means of an iron bar, the position of the animal's head could be located at a point at the center of the inside of the cylinder.

Observations on 5 cats were made daily from the time when the animals first opened their eyes until definite visual responses could be elicited. The first visually determined reaction observed was head nystagmus in response to the rotation of lines 2 inches in width. This response was found to occur first at ages between 14 and 17 days. At the ages of 20 to 23 days the first definite eye nystagmus was found. The lines were then reduced in width by substituting in order, 2.5 cm., 1.25 cm., and .625 cm. stripes, and it was observed that the eye nystagmus persisted almost undisturbed during all of these changes. The smallest line width employed corresponds to a visual acuity of approximately 43′ under the conditions in which the observations were carried out.

Flicker Discrimination in the Cat. WILLIAM E. KAPPAUF, Brown University.

A discrimination habit based upon flicker has been established in a group of 4 animals. Preliminary results on flicker fusion frequency as a function of brightness have been obtained.

The differential stimuli consist of 2 glass panels, 4½ inches square

and 10 inches apart, which are illuminated from behind by interrupted light from sources several feet distant. One light beam is always interrupted at a rate which well exceeds 100 times per second. This is far above the human fusion level at any of the brightnesses employed to date. The second beam of light may be interrupted at any desired frequency by making appropriate adjustments in the pulley-episcotister system. By means of a simple mirror arrangement, these beams may be directed upon either of the 2 stimulus panels in a way that completely eliminates auditory cues. Under otherwise dark conditions, 3 of the animals have been trained to approach the flickering field, while the fourth has been trained to respond negatively to this panel. When the level below the correct panel is pressed, food is received. In case of error, a shock is administered.

The critical frequency measurements now available indicate that the cat is capable of rather keen discriminations based upon flicker. When the brightness of the frosted glass panels was .87 candle per square foot, discrimination broke down at a rate higher than 50 per second. As brightness was reduced to .57 candle per square foot with the same frosted panels and to .0055 candle per square foot with panels of flashed opal glass, the average fusion speeds fell to 42/sec. and 33/sec. respectively.

Comparisons with human fusion speeds under the same situation are being made and further brightness levels are being investigated.

Thresholds of "Relative" Visual Movement Discrimination in Cats. JOHN L. KENNEDY, Brown University.

The present paper reports the results of experiments concerning the thresholds of differential response in the cat as based upon the ability to discriminate differences in velocity between 2 moving visual stimuli of the same pattern. Discrimination methods and a suitable apparatus for securing such thresholds are described.

Four animals were trained initially to discriminate between an illuminated cross on a black background, 9.5 cm. in radius with arms 1.5 cm. wide, revolving at 1 revolution in 4 seconds, and an identical stationary cross. They required respectively 200, 240, 260, and 160 trials to fulfil a criterion of 40 successive trials with not more than 4 errors.

Immediately after a constant response to the moving stimulus was established, the stationary cross was made to move at a velocity of one revolution in 32 seconds and then subsequently increased in

speed until the velocity of the standard (1 revolution in 4 seconds) was reached. The threshold ratios of relative velocity discrimination for the 4 animals used were found to be respectively 1.25, 1.25, 1.5 and 1.5.

The thresholds obtained here on cats are compared with similar thresholds on a chick and a human, as reported previously by other experimenters. A discussion of thresholds of various types of moving visual stimuli in relation to the attempt to quantify the effects of extirpation of the visual cortex in mammals is also presented.

Size Constancy in the Rhesus Monkey and in Man. NORMAN M. LOCKE, Hunter College.

A previous study by the author had indicated that perceptual constancy operated at different quantitative levels in the Rhesus monkey and in man. The object of the present experiment was to determine whether the phenomenon of size constancy was present in the perceptual reaction of the monkey, and if it were present, to what degree. If size constancy were demonstrated, a comparison was to be made between the results of 3 Rhesus monkeys and those of 3 children and 6 adults.

This experiment represents the first instance in which size constancy in the monkey was studied quantitatively, and one in which results were obtained from human subjects and monkeys under the same environmental conditions. The absolute scores are given, as well as a relative score—an " intention ratio."

The scores of both animal and human subjects indicate a high percentage of constancy in the simplified stimulus conditions used. Contradictory to the findings in color constancy, the response scores of the animals were well within the range of the human subjects.

Reduction and Rivalry of Differential Cues in Visual Discrimination Habits of Chimpanzees. HENRY W. NISSEN, Yale University.

Young chimpanzees were trained on visual discriminations in which the positive and negative stimuli differed in both size and brightness. After a criterion of 50 successive correct trials had been reached, 3 types of critical or test trials were introduced in random order: (1) Only one of the 2 original differentiating cues was available to the subject. (2) Size and brightness relations of the 2 stimuli were unchanged but absolute sizes differed from those of the training pair. (3) The 2 originally positive cues were opposed to

each other so that the subject had to choose between positive brightness (combined with negative size) and positive size (combined with negative brightness).

Results of 6 habits (2 for each of 3 subjects) and including 716 critical trials, may be summarized as follows: (1) An average score of 77% was obtained when only 1 of the 2 original cues was present. There was only one instance of a subject responding without error to one of the cues and giving a chance performance on the other; remaining scores on brightness or size alone ranged from 58% to 96%. Scores on single-cue tests were higher when the differentiating stimulus appeared in conjunction with the negative aspect of the non-differentiating "dimension" than when it was presented together with the positive aspect of the latter. (2) Transposition tests (change of absolute sizes only) gave an average score of 96%. The 2148 interpolated trials with original training stimuli averaged over 99%. (3) When the 2 positive cues were in opposition, preponderance of size- or brightness-choices corresponded in direction to the relative efficacy of these cues when each appeared alone. In one instance the opposition of cues which independently yielded chance and perfect scores, respectively, resulted in a 21–79% distribution of choices.

Some Relationships Between the Hunger Drive and Experimental Extinction. PAUL M. FITTS, JR., Brown University. (Introduced by L. Carmichael, Brown University.)

The apparatus consists of a modification of the Skinner lever-conditioning apparatus which delivers a small pellet of food to a rat each time a lever is pressed by the animal. The rats are allowed to feed for 1 hour each day in the experimental sound-proof box, no other food being given them. After the nature of the feeding rhythm has been determined and a uniform lever-pushing response established the rats are at definite times presented with the stimulus situation without reinforcement by food. In this way curves of extinction are secured. The drive of the rats is varied by allowing them to eat at a varying number of hours previous to the extinction trial period. The response is then reëstablished on the following day and at later times extinguished under changed drive states. Each drive condition is tested repeatedly over a period of time so that the influence of earlier extinctions is constant for the several degrees of drive.

Preliminary results indicate that the relationship between the degree of hunger, as measured in time since previous feeding, and the number of responses necessary to bring about experimental extinction is not a simple one. Tables showing the relationship between such hunger deprivation and extinction are presented. Tables are given also showing the characteristics of response of individual rats in a series of extinction situations.

Dominance Hierarchies in Pairs and in Groups of Macacus Rhesus Monkeys. A. H. MASLOW, Teachers College, Columbia University.

In a group of 6 macaques, every animal was paired with every other animal by a previously described social behavior technique. The behavior syndromes characteristic of dominant and subordinate animals, as previously determined, were generally confirmed except for grooming behavior. Mounting and bullying again proved to be the best measures of dominance, and cringing and flight were found to be the best measures of subordination. The hierarchy of dominance constructed from the results of the separate pairings was found to be perfect in the sense that it showed no circularity of dominance relationships such as had been found in birds (Schelderup-Ebbe; Murchison). This surprising result was adjudged to be probably a consequence of too great differences in weight of the animals in our group, even though these differences had previously been thought not to be significant. These animals, after all interpairings were completed, were formed into larger groups by successive introductions of the next most dominant animal (after the social relationships of the previous groups had been stabilized). It was found that new behavior emerged in these groups that was unpredictable from the data on pairings. Certain behavior proved definitely to be a function of the size of the group. A group of 3 animals was apparently a different kind of a group in a qualitative sense from a group of 2 animals. These new forms of behavior will be described for groups of 3 and groups of 4 animals. Because of these "new" dominance behavior principles, hierarchies in the larger groups were different from those in the smaller groups.

Mental Testing

Chairman, A. T. Poffenberger
Columbia University

A Methodological Study in the Measurement of the Interests of Children. Saul B. Sells, Columbia University.

This study arose from the need of students and teachers for an instrument for the measurement of the interests of children in school subjects. The research was done with the collaboration of Dr. Irving Lorge of the Institute of Educational Research and with the coöperation of Mr. Peter J. Di Napoli of the Department of Education, City of New York.

Previous research has indicated a relationship between liking for subjects and liking for words 'characteristic' of these subjects. Lists of 'characteristic' words were selected from the syllabi and textbooks for fifth and seventh grade arithmetic, geography, history, and English in the Department of Education of the City of New York. These words were then converted into a test of the check-list variety as follows: Part A, four words per line in rotated order; Part B, same procedure with the addition of one word each from a list of books and games for children of the ages tested. Directions were to underline the *one* thing on each line liked best. Two comparable forms of the test, called the I.E.R. Activities Inventory, were used in the experimental edition.

Twelve hundred children of both sexes, in 6 schools in New York and Brooklyn, in grades 5A and 7A were given both forms of the Activities Inventory, a specially prepared Biographical Inventory, and the Metropolitan Achievement Test, Advanced Battery, Form A, New York City Edition. This preliminary study will present the results on reliability and validity of the interest test, sex differences, and discussion of the method.

Relationships Between Constancy of Expressed Preferences and Certain Other Factors. Jack W. Dunlap, Fordham University.

One hundred and forty-seven seventh grade students marked the Dunlap Academic Preference Blank on 2 occasions separated by 10 months and the per cent of individuals marking each item identically on the 2 occasions was determined. It was found that items vary widely in terms of the constancy of response they elicit from individuals. Each item refers to a particular subject matter field; for

example, the item, "Aesop's Fables," is classified as literature. Items were classified by subjects and the mean item constancy determined. Certain subject matter fields were more constant than others.

Next the number of identical responses on the 2 blanks, classified by subject matter field, was determined for each student. The ratio of the number of identical responses within a particular field to the total number of items in that field furnishes a measure of constancy of the individual for that field or subject. Wide variations were found to exist among individuals in constancy within a particular field. Often a given individual varied widely in constancy from subject to subject. Constancy of response was investigated in relation to age, achievement, intelligence, preference, and constancy in other school subjects.

Influence of Order of Presentation of Items in Ranking. PERCIVAL M. SYMONDS, Teachers College, Columbia University.

An experiment in which 15 items were ranked by several hundred high school pupils presented an opportunity to investigate the influence of order of presentation of items on ranking. It was found that there is a linear relationship between order of items and tendency to overrank items on the list. Items coming early in the list tend to be overranked; items coming late on the list tend to be underranked. The relation between order of presentation of items and the standard deviation of the rankings showed no consistent trend, indicating that there seemed to be no tendency for greater discrimination to be shown in ranking the earlier items in the list.

Values for correcting rankings of any number of items for order of presentation are presented.

A Short Method for Selecting the Best Combination of Test-Items for a Particular Purpose. JOHN C. FLANAGAN, American Council on Education.

The present discussion is concerned with a method of selecting the combination of items which when credited either one or zero will give the best index of a given criterion. This is accomplished by means of an adaptation of the method of solving for regression coefficients by means of successive approximations.

The present procedure is very easy to use, consisting essentially in the repetition of the steps outlined below:

(1) Obtain by a short method such as the upper and lower groups procedure the correlation of each item with the criterion score and on this basis select a group of items to be called the trial-test.

(2) Rescore all the experimental test-papers considering only those items selected for the trial-test.

(3) Obtain the correlation between trial-test score and criterion score.

(4) Obtain as in step (1) the correlation of each item with trial-test score.

(5) Compare the correlations with criterion score and with trial-test score for each item. Add those items to the trial-test which are not adequately represented in this first trial set of items as shown by a higher correlation with the criterion than with the trial test. Correspondingly, remove items whose correlations with the criterion are lower than with the trial-test.

(6) Repeat steps (2), (3), (4), (5), until the correlation of the new trial-test with the criterion as obtained in step (3) shows no further improvement over the previous combination.

One of the principal advantages of the procedure is that in practice it has been found that the first approximation secures a very large proportion of the possible improvement and thus a comparatively small increment of labor will frequently result in a very substantial improvement in the validity of the combination of items selected for the final test.

Variations in Performance on Sub-Tests of the Stanford-Binet Scale of a Group of Letchworth Village Subjects Retested Over a Six-Year Period. ELAINE F. KINDER, Letchworth Village.

The Stanford revision of the Binet has been administered annually over a period of years to 110 Letchworth Village subjects of both sexes, with a total of 525 examinations. The children were those selected by Charles B. Davenport for a study of physical growth and development. The I.Q. ratings have remained relatively constant during the period of study, but the I.Q., as a composite measure, obscures recognition of the persistence of certain types of test performance. The analysis of the performance from year to year on the various sub-tests of the scale has shown: (1) that certain tests are passed consistently; (2) that certain tests are repeatedly failed in successive years in spite of increase in mental age; and (3) that for certain tests there is a high percentage of "mixed responses," *i.e.* alternations of success and failure. Though

the percentage of mixed responses increases at the higher test levels, this increase is not consistent for all test items. Some sex differences are indicated. Our data like those of Perkins, Louden, and others indicate that for retarded subjects the type of test material is a more important factor than the age placement of the test in determining success. The possible influence of a standardized institutional environment is discussed.

Factor Analysis of a Short-Item Drawing Test. WARREN G. FINDLEY, Cooper Union.

Data: A drawing test consisting of 30 problems was administered to 301 candidates for the Cooper Union Day Art School. The time limit for the test was 90 minutes. Of these candidates 283 completed the items of the test. Tetrachoric coefficients of correlation between the item responses of these 283 cases were calculated.

Procedure: The number of correct responses was less than 10% of the 283 cases for 5 items, so only the intercorrelations of the remaining 25 items were employed in a factor analysis. The Thurstone centroid method and the Hotelling method of principal components were applied first. The weights thus obtained were subjected to the conditions of "positive simple structure" proposed by Thurstone to produce only positive and zero weights in a factor pattern.

Results: First-factor loadings show high rank-order correlation with bi-serial r estimates of validity against the criterion of total score on the test. The unreliability of tetrachoric coefficients warranted fitting only two factors. Some tentative explanations of the second factor are offered.

Value: An indication of the costs and merits of factor analysis as a technique of item analysis and test evaluation is shown.

A Scale for Measuring Speaking Ability. ALICE I. BRYAN, Pratt Institute, and WALTER H. WILKE, New York University.

A rating scale was devised to secure audience reactions to public speakers. The scale of 20 items is divided into 3 parts, relating respectively to the speaker, the speech, and to a general estimate. Items cover many of the characteristics ordinarily regarded as significant, such as interestingness, activity, knowledge of subject-matter, and organization. The five-step scale for rating each item is comprised of 5 boxes containing words relating specifically to the item

in question and at the same time expressing a quantitative aspect of that item.

The reliability of the scale was checked in 3 ways, using several groups of raters. Internal consistency as measured by odd-even correlation was generally above .90, and will be reported for each group of raters. The reliability of the speaker's average rating, as determined by the correlation between the rating given by one-half of the audience and that by the other half, was likewise found to be over .90. The significance of the correlations between Part I, relating to the speaker, and Part II, relating to the speech, will be discussed in relation to the scale's reliability.

Data regarding validity include graphs of the distribution curve of total scores for each group of raters and graphs of the distribution curve of ratings for each item on about fifty speakers.

Information already obtained regarding the range of reactions to a single speaker, sex differences in rating tendencies, and the effect of delayed rating as against immediate rating will be summarized. Other applications to the study of audience reactions are in progress.

Physiological Psychology

Chairman, W. R. Miles
Yale University

The Effect of Extirpation of the Striate Cortex Upon Visually Controlled Palpebral Reactions, Compensatory Eye-Movements, and Placing Reactions of the Fore Limbs in the Cat. Karl U. Smith, Brown University.

This paper concerns the post-operative effects of removal of the striate cortex upon certain unlearned visually determined reactions in the cat.

Three series of experiments were made involving the observation in normal animals and in animals lacking the visual cortex of (1) palpebral closure to changes in light intensity brought about by movement of a card or the experimenter's hand before the animal's eyes, (2) compensatory movements of the eyes in a rotating visual field, (3) visual placing reactions of the fore limbs under different stimulus conditions, including circumstances of stimulation which may be said to be similar to those utilized in the second series of experiments.

Observation of 5 animals after removal of the visual cortex demonstrated that, although closure of the eyelids to movement of a card or of the experimenter's hand under normal conditions of illumination was abolished as a result of the operations, such responses were evoked in all 5 cats when the hand or card was moved across the visual field of the animal under extremely high retinal illumination. These observations, as well as those which showed that complete bilateral removal of the striate areas did not abolish compensatory lateral movements of the eyes to a rotating striped pattern, are taken as evidence for the existence of movement and pattern vision in cats lacking the striate cortex. Similar operations destroyed all visual placing reactions of the fore limbs, even under conditions of patterned stimulation comparable to those utilized in studying compensatory eye-movements. This fact points to a critical division of function between the nervous mechanisms mediating unlearned ocular reactions and those controlling the visually determined responses of the fore limbs and trunk.

A Comparative Study of Hearing in Vertebrates. ERNEST GLEN WEVER and CHARLES W. BRAY, Princeton University.

The electrical method has been used for the study of the action of the ear in a number of species of vertebrates (cat, guinea pig, rabbit, rat, opossum, pigeon, turtle, frog). This study includes the relation of responses to the frequency, wave-form, and intensity of sound stimuli. The highest frequencies for which responses in the cochlea have been observed are 25,000 ~ for certain mammals, 11,000 ~ for pigeons, 1000 ~ for turtles, and 600 ~ for frogs. A comparison is made between anatomical structure and the nature of the electrical responses.

The Electric Potentials of the Brain in the Mongolian Type of Mental Defective. GEORGE KREEZER, The Training School at Vineland, New Jersey.

This study represents one of a series of studies being made to determine the characteristics of the electro-encephalogram associated with various types and levels of mental deficiency. It is hoped that the results of such studies may provide clues to the brain properties underlying the psychological characteristics of the mentally deficient. The procedures used in this study are based on those used by Berger and involve the connection of electrodes to the head of the subject, the amplification of the electric potentials picked up, and the obser-

vation and recording of these potential waves by means of an oscillograph. Results so far obtained from the study of a series of mongolians will be reported. Properties examined in the records are the wave-frequencies obtained with electrodes placed over different regions of the brain, the course of development of these waves, that is to say, the form of the envelope enclosing the waves, the amplitude of the waves, and the effect of visual stimulation. Report will be made of the relation of these properties in mentally normal subjects and mongolians and the variations with mental age.

Wave Form of the Tarchanoff Response with Shock Stimuli. Preliminary Report. T. W. Forbes and M. Marjorie Bolles, New York State Psychiatric Institute and Hospital.

The "Vorausschlug" or quick negative deflection followed by a much larger positive deflection has been long known in connection with the Tarchanoff method of recording the galvanic skin response. It has been reported as occurring at times and at others not. Furthermore, changes of wave form from diphasic to monophasic have been reported by several investigators.

A previous report has shown that by use of a single reacting skin area, a regular variation of wave form can be obtained. In this study an insulated hypodermic needle through the skin of the arm was used as an inactive electrode. Recording was by means of a string galvanometer with skin potential neutralized, and 90 to 180 volts of continuous current shock served as stimuli. The shock was administered to the finger tips by means of moist pads by the subject himself in order to control as far as possible any anticipatory responses. Normal subjects were used.

The same general type of wave form variation has been obtained, showing that both the *a* and *b* waves arise unquestionably from a single reacting area. As before, the second or *b* wave decreased in intensity, but additional evidence was obtained which indicates that the return of the *b* wave is not merely a larger reaction to greater intensity. It shows a perseveration effect, and its appearance with intense stimuli is apparently dependent upon production of apprehension or excitement of some sort by the stimulus. It is suggested that the *b* wave is more closely connected with a sympathetic type of response (probably sweat-gland activation) but that the *a* response may also be useful as an indicator of reaction.

Care should be taken in conditioned response studies not to confuse re-entrance of the *b* wave with disinhibition.

Sentiment and Emotion. W. G. SUMMERS, Fordham University.

Empirical and experimental studies of sentiments and emotions have presented conflicting results. The more recent studies tend toward the identification of these 2 mental activities. The present investigation offers definite evidence to show that there is a fundamental difference between these activities.

A new psychogalvanometric technique was used in conjunction with a controlled introspective procedure. The results show that the physiological factors present in emotions correlate very poorly with the essential factors of sentiments. Emotion would seem to be a sensory phenomenon and sentiment essentially an intellectual phenomenon.

Unscrambling Emotion. WILLIAM A. HUNT, Connecticut College for Women.

This paper attributes the failure of previous studies to ascertain definite response patterns in emotion to a misunderstanding of the nature of the problem. Analysis of a typical emotional situation indicates the presence of multiple responses blended together in a complex reaction. Simple observation is not enough under the circumstances. Some technique of unscrambling the components is necessary. Two such techniques, one of ultra-rapid photography, the other of mathematical analysis, are here suggested and applied. The results indicate the existence of some definite patterns in emotion, and one such pattern is here described.

CHILD AND ABNORMAL PSYCHOLOGY

CHAIRMAN, A. GESELL
Yale University

Quantitative Studies of Human Gait and Its Development. A. DOUGLAS GLANVILLE and GEORGE KREEZER, The Training School at Vineland, New Jersey.

In a program of research to investigate motor activities at different levels of complexity, gait was selected for study as an example of an important and highly complex human motor activity. A method has been devised which permits quantitative measurement and graphic representation of certain essential activities which take place when the individual walks. Moving pictures of gait are analyzed to show the changing angular relationships of hip, knee, and

ankle joints. Other properties of gait, such as length of stride, width of foot-base, velocity of gait, and the angle of the trunk with the vertical are also examined.

Preliminary norms on adults have been obtained and results are presented to show how the method may be used to study the genetic development of gait in children and the variations in gait associated with developmental deficiencies.

Cutaneous Localization Among Normals and Subnormals. THEODORA M. ABEL, General Education Board.

In studies on cutaneous localization Renshaw found differences between children and adults in preferred method of making localizing responses. Children are more accurate in making tactual kinesthetic localizations blindfolded (Tactual-Kinesthetic Method), while adults are more accurate when allowed to use vision in guiding their localizing responses (Visual Method).

In our experiment we compared the performance of normals and subnormals who had reached approximate physical maturity to see in what way subnormals would function like adults or like children in making skin orientations. In the first place, 10 normal girls (C.A. 16; I.Q. 85–110) and 10 subnormal girls (C.A. 16; I.Q. 50–64), made 5480 localizations. The stimulus was always applied to volar surface of non-preferred forearm. The subnormals reacted as did children in responding more accurately by the Tactual-Kinesthetic Method, while the normal girls were more accurate by the Visual Method.

Secondly, a group of 11 specially selected subnormal boys and girls (C.A. 14–16, I.Q. 47–74), having M.A.'s on the Goodenough drawing test at least three years higher than their M.A.'s on the Stanford Binet, made 3080 localizing responses. These subjects not only performed much better by the Visual Method of localizing than by the Tactual-Kinesthetic Method but their performance by the Visual Method was reliably superior to that of the normals.

Incentive Value of a Symbolic Reward With Mentally Deficient Children. ANTHONY J. MITRANO, Vineland Training School, and Yale University.

The purpose of this experiment was to determine whether feebleminded children, below the mental age of five years, would strive as hard to get poker chips, which could be exchanged for

candy, as they would strive to get the candy. The apparatus consisted of (1) a machine yielding poker chips when marbles were inserted and (2) a machine yielding candy when poker chips were inserted. The strength of the "secondary" drive was measured by the number of marbles inserted when no chips were forthcoming; the strength of the "primary" drive was measured by the number of chips inserted when no candy was forthcoming.

The evidence, derived from a study of 2 groups with 30 subjects in each group, tends to support the conclusion that the feebleminded children will strive as hard to secure the symbolic reward, as they will to get the reward. The extreme variability of both groups, however, does not permit the drawing of rigorous conclusions.

In connection with this subject, the writer will present data bearing on the curve of experimental extinction and on the phenomena of disinhibition.

A New Method for the Study and Treatment of Enuresis. O. H. MOWRER, Yale University, and WILLIE MAE COOK MOWRER, Children's Community Center, New Haven.

Despite the high percentage of enuresis cures achieved by particular investigators through the use of various methods, the fact remains that none of these methods has proved to be generally applicable. It has long seemed to the writers that, were it only possible to have the child promptly wakened as soon as he starts urinating, enuresis would speedily disappear. Through a process of conditioning, the stimulation resulting from bladder distention, which had previously produced relatively automatic sphincter release, would now become a stimulus for waking and an inhibitor of urination. By thus bringing sphincter release under voluntary control, the child should rapidly become able either to retain his urine until morning or to get himself up whenever necessary. Moreover, if an adult were awakened along with the child, this procedure, in addition to teaching the child the dry-bed habit, would provide an excellent opportunity not only to study the enuretic habits of the child but also to follow accurately the course of his recovery.

An apparatus will be described which has been developed for the purpose of automatically waking the enuretic child within one or two seconds after he starts urinating, and results will be reported which show that this method has led to what appear to be permanent

cures in all (7) children thus far treated. The writers are inclined to believe that this method may prove much more generally useful than previous methods of treating enuresis in that its success seems to be relatively independent of the personality and skill of the individual applying it.

A Follow-up Study of Twenty-four Feebleminded Children of the Mongol Type. MILES MURPHY, University of Pennsylvania.

During the years 1914 to 1924 inclusive 52 mentally defective children classified as Mongols were examined in the Psychological Clinic of the University of Pennsylvania. In a follow-up study conducted during 1934–35 contact was made with the families of 25 of these children. In one of these cases the information supplied by the parents was not of sufficient value to be used in the study. Of the remaining 24 cases 17 were living at the time of the follow-up, and 7 had died. Those who were living ranged in age from 13 to 27 years, with a median age of 20 years. Of these cases 6 were in institutions, and 11 were at home. The study is devoted to analysis of the group and to individual case studies.

The Marital Factor in Mental Disease. JAMES PAGE and CARNEY LANDIS, N. Y. State Psychiatric Institute and Hospital.

Two aspects of the problem will be considered. (A) The relative incidence of mental disease in the single, married, widowed and divorced general population will be considered. (B) The marital status of the first admissions to mental hospitals will be compared with the marital status of the general population.

With respect to (A), data will be presented indicating that if we consider the rate of first admission per 100,000 married population as 1, then the rate for the divorced population is about 4, the rate for the single population is slightly more than 2 and the rate for the widowed population is slightly less than 2.

With respect to (B), data will be presented indicating that first admissions to mental hospitals in New York State and the United States have almost the same percentage of widowed individuals as the general population, but have a higher percentage of divorced and single individuals and a lower percentage of married individuals than the general population.

The marital status of each of the principal psychoses and psychoneuroses will be separately analyzed.

MEMORY AND LEARNING

CHAIRMAN, H. S. LANGFELD
Princeton University

Knowledge of Results of Responses Compared with After-Effects Following Each Response in a Learning Situation. ROBERT T. ROCK, JR., Fordham University.

Knowledge of results for series of responses, such as "You had six right" may promote learning by influencing the learner's attitude toward the situation, causing him to strive harder, or such knowledge of results may influence learning by "confirming" and making more likely the repetition at later trials of all responses given in series called good, and by failing to "confirm" any of the responses in series called poor. The present investigation is concerned principally with the second of these possible modes of operation.

One hundred children served as subjects in an individually administered word-number association experiment, the task being to learn which number from 1 to 5 was the arbitrarily determined "correct" response for each of a list of words. Each series consisting of 8 stimulus words was presented for 5 trials, the experimenter reading one word at a time and recording the subject's response before reading the next word. Comparable series were presented to all subjects under 4 conditions: (1) Announcement of number of right responses in each series, (2) statement "Right" or "Wrong" following each response, (3) statement as in (2) with announcement of number of right responses at end of each series, (4) no announcement at end of series or statement following any response.

The data indicate that in a well-motivated learning situation consisting of independent tasks, knowledge of results for series of responses without indication of specific rights or wrongs has only a slight influence upon learning, and announcement of number right in series of responses adds very little to the effectiveness of the statement "Right" or "Wrong" immediately following each response.

Retroactive Inhibition as a Function of the Relative Amounts of Original and Interpolated Materials. JOHN A. MCGEOCH, Wesleyan University.

The problem of this experiment was to measure the decrements in retention produced by interpolated lists of 2 different lengths.

Original lists of 16 two-syllable adjectives have been given a standard frequency of 8 presentations and have been relearned after 20 minutes. The interval was filled either by reading humorous short stories (rest) or by the learning of a second or interpolated list of adjectives (work). In 3 work conditions the interpolated lists contained 16 items and were given frequencies of 4, 8 or 16 repetitions. In 3 other work conditions the interpolated lists contained 8 items and were given frequencies of 4, 8 or 16. Forty subjects went through all conditions in a counterbalanced practice order. Learning was by the anticipation method.

Every interpolation of 16 adjectives produces a greater decrement in retention than does any interpolation of 8 adjectives, regardless of relative frequency and of attendant degree of learning. Inhibition is, thus, under these conditions, a function of the relative lengths of the original and interpolated lists, while relative frequency is comparatively unimportant.

There is no differential distribution of inhibition over the serial positions of the original list as a result of variation in the number of the interpolated adjectives. The inhibitory influence of the shorter list is, thus, not specific to any serial position.

These results can more readily be interpreted by the transfer theory than by the perseveration theory. The hypothesis to be stated is that the transfer takes place according to the paradigm of reproductive inhibition and that 3 important common factors are experimental context, areal position in the series, and connection with a common item in the language organization of the subject.

"Reminiscence" Following Learning by Massed and by Distributed Practice. CARL IVER HOVLAND, Yale University.

Increased retention of nonsense syllable material following cessation of learning is explained by Hull (1935) in terms of a more rapid dissipation of 'inhibitory' than 'excitatory' tendencies. This theory would demand that the increase ('reminiscence') be greater following massed practice than following distributed, since in the latter the 'inhibition' becomes dissipated between successive trials.

Thirty-two subjects learned one series of 12 nonsense syllables per day for 16 consecutive days by the anticipation method. The syllables were presented at two-second intervals. Between successive trials of the distributed practice and during the two-minute period following learning the subjects named colors, thus obviating rehearsal.

Results confirmed Ward's findings that more material is retained and fewer relearning trials are required, when 2 minutes elapse between learning and testing than in control cases where retention is tested immediately.

Following learning by massed practice to a criterion of 7 out of 12 syllables the improvement after the two-minute period was 8% when measured by recall scores and 22% when measured by relearning trials. Following distributed practice, on the other hand, the comparable increases were 1% in recall scores and 5% in rate of relearning. As also predicted by the theory the improvement after the rest pause following massed practice was principally in the central portion of the series. Twenty-three per cent fewer trials were required for the learning by distributed than by massed practice.

When the interval between the presentation of syllables was increased from 2 seconds to 4 seconds the curve of difficulty became markedly flattened, suggesting removal of some 'inhibitory' effects. Distributing the practice on this series resulted in a saving of 2% in the number of learning trials. Under these conditions reminiscence did not occur following either massed or distributed practice.

The Effect of Practice on Visual Acuity. ROBERT G. WETMORE, Columbia University. (Introduced by C. J. Warden.)

The Problem: To determine possible practice effects on repeated determinations of visual acuity.

Subjects: Three subjects were used, all university graduate students, and all of normal or nearly normal vision.

Apparatus: Ives Visual Acuity Apparatus, common in optometrical practice. By means of diffraction gratings, it presents to the subject a circular test field of alternate dark and light bands. The subject responds by indicating the direction assumed by the bands.

Method: Modified method of Constant Stimuli.

Procedure: Each experimental session consisted of the presentation of 144 stimuli of 6 sizes, which were selected so as to give a range of responses slightly smaller than that between the chance expectation and consistently correct responses.

Each size of stimulus was given twice in each of the 6 possible positions allowed by the apparatus, in random order. After a ten-

minute rest period, the foregoing procedure was repeated. Each subject received 16 sessions, in all but a few cases 1 day apart.

Opportunity for adaptation was given at the beginning of each session, and after each rest period.

Results and Conclusions: The results failed to indicate any improvement in acuity from one session to another.

When each session was divided into 4 equal units (in terms of the number of responses made), and all sessions for each subject lumped together in this fashion, it was found that there was a definite improvement within the session. Critical ratios were not conclusive in most cases, yet the perfect consistency and uniformity of trend for each subject indicate that within the single session, some practice effect is present.

Modification of Median Plane Localization by Response. C. H. PEARCE, Princeton University.

The purpose of this experiment is to analyze the modification of auditory localization by response. Sounds in the median plane were responded to by the movement of the hand to the right or left to insert a stylus into a particular hole in a board. The subject was instructed to report also whether the sound appeared to be to the left, to the right, or in the median plane. Following the report the stylus was placed in the correct hole by the experimenter, and the subject noted this correction. The judgment as to left or right was not corrected. There were 5 stimulus positions and 5 holes. In 1 group of experimental subjects response to the 2 front positions was toward the left and response to the 2 rear positions was toward the right. In a second group these relations were reversed.

Subjects in a control group used the same situation, but instead of a movement of the hand to left or right, the position of the sound with respect to front or rear was indicated by a number, that is, verbally.

Results indicate that when the response to the sound is the movement of the stylus to left or right the sounds are heard to come from the left more often when the responses are toward the left, and more often from the right when the responses are toward the right. Control subjects either fail to report sounds appearing to left or right, or show a distribution of lateral displacements which is not consistently related to the position of the sound source with respect to front or rear.

The Evolution in the Form of Certain Motor Reactions. HARRY MCNEILL, Fordham University.

Ten subjects were required to hit successively, at high speed, while keeping time with a metronome, 4 targets on a table. The constant errors, made by reason of the high speed, were recorded by a special technique and the trajectories followed by the subjects in making the hits were photographed. After each 100 repetitions, the positions of the targets were changed in view of the errors made, so as to facilitate accuracy. It was found that the resulting displacement of the targets follows a typical pattern. This will be described, together with its influence on the accuracy.

PROCEEDINGS OF THE WESTERN PSYCHOLOGICAL ASSOCIATION, SEATTLE, WASHINGTON, JUNE 19–20, 1936

ROBERT C. TRYON, SECRETARY, UNIVERSITY OF CALIFORNIA

The Association met with the Pacific Division of A.A.A.S. at the University of Washington. Special features of the meeting were, on June 19 a symposium on the question "In What Terms Are Motives and Conflicts to be Described?", and on June 20 a joint session with anthropology. Approximately 100 attended the meetings. The chairman of local arrangements was R. H. Gundlach.

Officers elected for the ensuing year, 1936–1937, were:

President: Milton Metfessel, University of Southern California, Los Angeles.

Vice-President: Robert C. Tryon, University of California, Berkeley.

Secretary-Treasurer: Frank C. Davis, University of California at Los Angeles.

The Association will meet in June, 1937, at the Clarement Colleges, Claremont, California.

PROGRAM

The speakers in the symposium were:

William Griffith, Reed College.
Edwin R. Guthrie, University of Washington.
Calvin S. Hall, University of Oregon.
E. R. Hilgard, Stanford University.
Calvin P. Stone, Stanford University.
Edward C. Tolman, University of California.

The papers presented in the other sessions were:

Some Difficulties in Conditioning Galvanic Skin Responses. R. K. CAMPBELL, Stanford University. (Introduced by E. R. Hilgard.)

Conditioned galvanic skin responses were established by following a light regularly with an electric shock. An attempt was made to secure discrimination between 2 adjacent lights, only 1 of which was reinforced. The experiments to date have been only moderately

successful. There are 2 chief disturbing factors. (1) Generalization is such a prominent feature that responses to the positive and negative stimuli tend to remain nearly equal, although the negative stimulus has never been reinforced. (2) The conditioned galvanic response, unlike certain other conditioned responses, appears at nearly maximum value and gradually decreases, although reinforcement is continued. It is difficult to maintain the positive response at sufficient magnitude for enough trials to secure differentiation.

Maze Learning with a Differential Proprioceptive Cue. LAUNOR F. CARTER, University of Washington. (Introduced by Stevenson Smith.)

Two related arm-maze learning problems are described. In one problem the subjects learn the maze under conventional conditions; in the other the subjects learn the maze under normal conditions except for the addition of a differential proprioceptive cue. The error scores of the proprioceptive group are smaller than the control group by a statistically reliable difference. A new method of screening mazes from the subject's view is described.

The Alleged Retroactive Effect of Visual Stimuli Subsequent to a Given Response. FREDERICK A. COURTS, Reed College. (Introduced by H. R. Crosland.)

The present investigation represents an attempt to determine the influence of "emphasis" uncomplicated by the factor of informative cue. Thirty-six subjects learned to choose the correct syllable of thirty pairs of nonsense syllables presented in random order. Practice trials, during which both the correct and the incorrect responses occurred for each pair of syllables, were alternated with test trials, in which the subject attempted to reproduce the correct responses. In the practice trial the correct response for 10 pairs of syllables was followed by the flashing of a light. With 10 others the light followed the incorrect response. In the case of the remaining ten syllables there was no illumination. During the test trials there was no illumination nor information of success or failure. In the practice trial each response was followed by the word "right" or "wrong." Thus, the light was something over and above the information of success or failure. No significant differences were found between the numbers of errors under the 3 conditions. Since the various investigations which purport to prove the retroactive effect of stimuli subsequent to a given response have not provided a suitable control for the factor of information, and since where such a control has been

provided this retroactive influence has not been observed, it is concluded that the alleged influence of "emphasis" in learning is due to the factor of information rather than to that of "emphasis" uncomplicated by other factors.

The Relation of Occupation and Social Status to the Incidence of Neuroticism. HERBERT B. GALTON and WILLIAM GRIFFITH, Reed College.

The Clark Revision of the Thurstone Personality Schedule was administered to 6 groups, consisting in all of 967 individuals, to test the validity of the term "depression neurosis" and to determine group differences in neuroticism. The reliability of the test is much higher than is usual with personality tests. A comparison of test scores with clinical classification shows a far better than chance relationship, which becomes more positive as the degree of maladjustment increases, indicating a high validity. Not all high scores indicate neurosis, however, nor do low scores always mean normality. Unemployed men did not differ significantly from the college population, though they were more neurotic than unemployed boys in camps. Unemployed boys were slightly better adapted than college men, though significantly less well adapted than employed men, a fact which leads one to believe that the economic depression has not affected unemployed boys to any large extent when compared with college men of somewhat equal age. This suggests either that education makes for neuroticism, or that neuroticism is a function of age. A negligible disparity was found between employed civilians and soldiers. College women were significantly more neurotic than either college men, or unemployed boys, or the entire male population. Age and occupation have a steadying influence on the individual; employment means security, and security makes for stability.

The Structure and Image-Forming Power of the Eye of the Pigeon. RALPH H. GUNDLACH and RAY D. CHARD, University of Washington.

A study designed to investigate the physiological and anatomical basis of the vision of homing pigeons. Tests were made on the live bird to find the axes of vision, and the functions of the accessory structures of the eye. Gross anatomy was studied by macro-dissection; fine anatomy was determined by careful analysis of slide material. Special techniques designed to avoid distortion and relaxation of internal eye muscles were used to study corneal curvature and accommodation.

Thorndike's Concept of "Belonging." EDWIN R. GUTHRIE, University of Washington.

An Experiment on the Directional Determination of the Visual After-Image Drift. THOMAS G. HERMANS, University of Washington.

It has been a common assumption that the drift of the visual after-image is either a tropistic or voluntary movement of the eye, and that the direction of the drift is determined by the location of the retinal stimulation relative to the fovea. Another factor may be the muscular tensions during the retinal fatigue predisposing to a drift in a certain direction. This factor is evaluated experimentally. The data indicate that these muscular tensions are an important determiner of the direction of the drift when the image is centered upon the fovea but of little importance when not.

A Preliminary Report on Distance-and-Direction as a Factor in Error Distribution in the Multiple-T Maze. LEO HOLCOMB, University of Washington. (Introduced by Ralph H. Gundlach.)

The theory is advanced that there are 2 types of blinds in multiple-T mazes: direction-continuing and direction-reversing. Specific distances and directions define these blinds and may account for the relative magnitude of errors on a given blind. A multiple-T maze was assembled to test the hypothesis, by comparing the predicted difficulty with the experimentally determined difficulty of the blinds. All sensory cues were effectively eliminated except tactual and proprioceptive (distance) cues. These 2 were controlled by: (1) interchanging the sections on 4 strategic occasions, (2) interchanging sections and altering distances between choice points on 2 occasions. Questions arise with regard to details of the theory. Several incidental observations are evaluated.

The Determination of Olfactory Thresholds. GENEVA KENWAY, University of Washington. (Introduced by Ralph H. Gundlach.)

The threshold for various odors was determined in terms of molecules per cubic centimeter in air flowing at a constant, measured rate. A concentration was estimated from the temperature and pressure under which vaporization occurred. Variations in concentration are produced by dilution of known amounts of vapor with a controlled amount of pure air.

The Possibility of Diagnosing Interest and Ability Through Tests of Technical Vocabularies. HERBERT C. MCMURTRY, University of Oregon. (Introduced by H. R. Taylor.)

Knowledge of the meanings of words used in mathematics and in the study of literature has been compared with the general vocabulary of a group of college students, in order to determine whether content is an important factor in the generality so characteristic of vocabulary tests. Diagnostic use of such tests is not feasible unless the commonality between 2 general vocabulary tests is considerably higher than that between vocabulary tests in specialized fields. The size of significant differences in the test scores of individuals has been evaluated for the Seashore-Leighton test of general word meanings, a mathematics test of essentially the same sort, and a test of technical literary terms. The three tests were split into odd and even series, administered a week apart. Gains from one week to the next are also considered with reference to possible systematic differences in the performance of individuals.

The Effects of Stereotyped Words on the Formation of Political Opinions. SELDEN C. MENEFEE, University of Washington. (Introduced by Ralph H. Gundlach.)

A carefully controlled experiment, using more than 400 college students and others as subjects, was performed to determine how the addition of certain political stereotyped words affected the acceptance of statements appropriate to those terms. The use of the terms "Fascism," "Radicalism" and "Communism" produced a marked negative effect upon the judgments of the subjects. In addition college students showed a positive reaction upon the addition of the term "Socialism." These results coincided closely with the reaction to the stereotypes presented alone.

The Reliabilities of Tests of Waking and Hypnotic Suggestibility. BENJAMIN N. SALTZMAN, University of Oregon. (Introduced by Lester F. Beck.)

In order to determine the reliabilities of semi-prestige and prestige tests of waking and trance suggestibility, the following tests were administered to 25 men and 25 women students: (1) Shock Test, (2) Bob Sway Test, (3) Hand Steadiness Test, (4) Postural Sway Test, (5) Arm Sway Test, (6) Optical Fixation, (7) Auditory Fixation, (8) Verbal Trance Suggestion. Accompanying the Verbal Trance Suggestions were qualitative indices of the depth of hypnosis resulting from sleep suggestions. The administration of

the tests followed a two-cycle plan, one trial being given on each test per cycle, followed by a retest within 3 weeks. It was found that with the exception of Hand Steadiness, which had a reliability coefficient of .485, the inter-trial reliabilities for all the tests exceeded .876. Retest reliabilities were on the average about 14% lower than those computed between 2 trials of the same test. The results show that suggestibility as measured by the above tests is a comparatively stable aspect of human behavior.

Discriminatory Conditioning of Eyelid Reactions. W. N. SEARS, Stanford University. (Introduced by E. R. Hilgard.)

Conditioned eyelid reactions were developed to an illumination increase which preceded a puff of air to one cornea. The positive conditioned stimulus occurred as a flash of light on 1 of 2 adjacent frosted glass windows, and was regularly followed by the air-puff. The negative stimulus, never reinforced by the air, consisted of a similar light flash on the other window. Verbal reports showed that there was no difficulty in perceptual discrimination between the right and left windows, and, after a few presentations, subjects were aware that the air-puff followed only one of the stimuli. The course of conditioned discrimination is gradual, even after the subject is able to state in words the nature of the situation in which his responses are occurring.

The Validity and Reliability of Certain Indices of Change in Skin Resistance as Measures of Affectivity. NATHAN W. SHOCK and C. COOMBS, University of California.

A Comparison of Criteria for Admission to Medical School, Covering the Period from 1926 to 1933. HOWARD R. TAYLOR, University of Oregon.

The reliability of estimates of medical school scholarship during the first 2 years is compared with the reliability of grades in lower division work in college. The predictive significance of the A.C.E. Psychological Examination given at entrance to the Medical School and also at entrance to the University of Oregon is compared. The relationship of the A.C.E. Examination to the Moss Medical Aptitude Test is determined. The predictive significance of college scholarship, of the Moss Medical Aptitude Test and of the Admission Committee estimates of candidates are evaluated in terms of medical school scholarship. Finally the implications of the findings for improving methods of selecting medical school students are set forth.

The Effects of Reward, Punishment and Exercise on "Connections." E. C. TOLMAN, C. P. PROWSE, and G. KUZNETS, University of California.

Trial and error experiments similar to some of the recent ones of Thorndike, in which subjects were required to learn to respond to successive stimulus words by appropriate digits, were repeated. Our purpose was to investigate further the finding that, whereas "reward" immediately strengthens such connections, "punishment" does not immediately weaken them. Our findings overtly considered tended, for the most part, to agree with Thorndike's, for in most set-ups the responses punished by "wrong" on the first trial did appear on the second trial with frequencies as great as, or even in some cases greater than, chance. A further analysis of the various set-ups seemed to indicate, however, that this was due to the fact that the negative effect of punishment really has to work against opposing positive factors, to wit: initial predispositions for certain numbers and exercise.

General Semantics: An Extensional Foundation for Psychology. JOSEPH C. TRAINOR, Ellensburg State Normal School.

General Semantics represents a new area of psychological inquiry established by A. Korzybski. Its uniqueness lies in its overlapping many fields of modern science. Basic data are the facts of psychiatry, recent work in colloidal biochemistry, a detailed analysis of the behaviors of the mathematician, and the newer physiology and neurology. General Semantics is non-elementalistic, based upon concepts of order and structure. The evidence indicates the presence of a general mechanism operating throughout the human nervous system. Human behavior may be classified as sane, insane or unsane, the criterion being the relation between structure of the thought processes (language) used and structure of the real world. Possibility of inter-translating such varied theories as psychoanalysis and behaviorism is given. Basic concepts are extensionalized by mathematical devices, thus releasing psychology from inhibitions of intensional heritage. Applications to education, intelligence testing, handling of atypicals and psychopaths indicate practical value.

PROCEEDINGS OF THE THIRTY-FIRST ANNUAL MEETING OF THE SOUTHERN SOCIETY FOR PHILOSOPHY AND PSYCHOLOGY

LYLE H. LANIER, SECRETARY, VANDERBILT UNIVERSITY

The Thirty-First Annual Meeting of the Southern Society for Philosophy and Psychology was held in Atlanta, Georgia, on April 10 and 11, 1936, at the invitation of Agnes Scott College. The Henry Grady Hotel was the headquarters of the Society, and all sessions were held in the hotel.

The Council met on April 9, at 8:30 P.M., with President Albert G. A. Balz presiding. Other members present were: Geldard, Johnson, Lanier, Pattie, Sanborn, ten Hoor, and Winter.

The program consisted of 5 sessions in which 36 papers were presented. Separate psychology and philosophy sessions were held on Friday morning and on Friday afternoon, April 10. A joint meeting was held on Saturday morning, followed by the annual business meeting. Nineteen psychological and 17 philosophical papers were read.

The annual banquet was held on Friday evening, April 10. Following the banquet Dr. Albert G. A. Balz read the presidential address, entitled "The Metaphysical Infidelities of Modern Psychology."

MINUTES OF THE ANNUAL BUSINESS MEETING

The Southern Society for Philosophy and Psychology convened for its annual business meeting on Saturday afternoon, April 11, at 12:10, with President Balz in the chair.

It was voted that the minutes of the Thirtieth Annual Meeting, held in Nashville, Tennessee, be approved as printed in the PSYCHOLOGICAL BULLETIN of October, 1935.

The treasurer presented a report, approved by the Council, in which receipts of $235.50 and disbursements of $100.91 were recorded for the year 1935–1936. The difference of $134.59 represented the gain in assets for the year and the addition of this sum

to the cash balance at the end of the last fiscal year ($466.76) gave a cash balance on April 11, 1936, of $601.35.

No formal committee reports were presented. The secretary announced the completion of the report of the Committee on the Teaching of Philosophy and the approval of the report by the Council. At the last business meeting this Committee was authorized to print and distribute to southern colleges copies of the complete report, after the latter had been approved by the Council. The secretary reported further that the Council had recommended that the Committee prepare and publish a digest of the report in the *Journal of Philosophy*. A motion was passed authorizing the chairman of the Committee, Dr. H. C. Sanborn, to prepare such a digest for publication.

Upon recommendation of the Council, the following new members were elected:

Bradshaw, Francis F., University of North Carolina, Chapel Hill, North Carolina
Cresswell, John R., West Virginia University, Morgantown, West Virginia
Garnett, Christopher B., Jr., George Washington University, Washington, D. C.
Harrell, Thomas W., Johns Hopkins University, Baltimore, Maryland
Kalif, George, Tulane University, New Orleans, Louisiana
Kohanski, Alexander S., Vanderbilt University, Nashville, Tennessee
Leatherman, Clarence D., Johns Hopkins University, Baltimore, Maryland
McGehee, Frances, Johns Hopkins University, Baltimore, Maryland
Obenchain, I. R., Birmingham Public School System, Birmingham, Alabama
Patterson, Robert L., 3908 N. Charles St., Baltimore, Maryland
Phillips, Harold C., Johns Hopkins University, Baltimore, Maryland
Wallace, S. Rains, University of Virginia, University, Virginia
Wilder, Carlton E., Johns Hopkins University, Baltimore, Maryland
Young, Florene Mary, University of Georgia, Athens, Georgia

Upon recommendation of the Council, the following officers and members of the Council were elected: President, Lyle H. Lanier, Vanderbilt University; Secretary-Treasurer, Frank A. Geldard, University of Virginia; to the Council, C. P. Heinlein, Florida State College for Women, and Fritz Marti, University of Maryland.

The secretary announced that invitations had been received to hold the 1937 meeting at the following institutions: Johns Hopkins University, George Washington University and the Society for Philosophical Inquiry of Washington, D. C. (jointly), Southwestern College, and Tulane University. He announced further that a group of southern scientists interested in forming a southeastern division of the American Association for the Advancement of Science had requested the Southern Society for Philosophy and Psychology to hold its next meeting in Atlanta (or some other centrally located city to be decided upon), in conjunction with the meetings of other scientific societies in this region, for the purpose of making possible a thorough consideration of the proposed organization. Dr. Emily S. Dexter, who was a member of the group which had discussed the preliminary plans for the regional A.A.A.S. branch, outlined the general objectives of the project and described the tentative plans for the general meeting next spring. In the course of the discussion, Dr. Josiah Morse transmitted from the floor an invitation to hold the next meeting at the University of South Carolina. It was finally voted to empower the Council to decide between the University of South Carolina and the place selected for the regional A.A.A.S. meeting, after detailed plans for the latter had been submitted.

Dr. ten Hoor announced that a telegram had been sent by the Council to Dr. Knight Dunlap, who had recently gone from Johns Hopkins University to the University of California at Los Angeles, expressing regret that Dr. Dunlap could not attend the meeting of the Society. The telegram was sent in appreciation of Dr. Dunlap's many years of loyal support of the Southern Society for Philosophy and Psychology.

A motion by Dr. F. A. Pattie was passed which authorized the President to appoint a committee to draw up resolutions on the death of Dr. Joseph Peterson. The secretary was instructed to insert the resolutions into the minutes of the meeting and to send a copy to Mrs. Peterson. President Balz appointed Drs. Sanborn and Lanier to serve as the Committee. The resolutions are as follows:

"WHEREAS the Southern Society for Philosophy and Psychology has lost one of its oldest and most eminent members through the death of Dr. Joseph Peterson, and

WHEREAS Dr. Peterson served the Society with distinction as President, as a member of the Council, and as a regular contributor to its programs, and

WHEREAS Dr. Peterson worked faithfully and effectively to ad-

vance the professional development of psychology in the South—both as Chairman of the Society's Committee on the Teaching of Psychology, and through the training of graduate students for psychological positions in southern colleges, and

WHEREAS Dr. Peterson represented the South for many years in important offices and on important committees of national organizations concerned with the development of psychology,

BE IT RESOLVED that the members of the Southern Society for Philosophy and Psychology hereby express their deep regret at the passing of so eminent a psychologist, and their feeling of profound sorrow at the loss of a character so genuinely respected and universally admired.

It was voted officially to thank the local representatives from Agnes Scott College, and especially Dr. Emily S. Dexter, for the excellent arrangements provided for the meeting.

PROGRAM

I. Psychology Papers

A Study of the Selection of Rachitic and Anti-rachitic Diets in the Rat. C. E. WILDER, Johns Hopkins University.

Evidence of Color Vision in Rats. NORMAN L. MUNN, George Peabody College.

The Modification of Goal Gradient Behavior by Means of Variable Preliminary Feeding. CLIFFORD T. MORGAN and PAUL E. FIELDS, Maryville College.

The Sensitivity of the Finger Tips to Alternating Electrical Current at Various Frequency Levels. B. VON HALLER GILMER, King College.

A Further Study of Consonance Discrimination. EUGENE G. BUGG, Vanderbilt University.

A Description of Interactional Phenomena in Binocular Vision. S. R. WALLACE, University of Virginia.

The Effectiveness of Visual vs. *Auditory Presentation of Material.* KATHERINE T. OMWAKE, Agnes Scott College.

Some Preliminary Tests of the Use of the Artificial Larynx with Stutterers. JOHN M. FLETCHER, Tulane University.

The Validity of Certain Mechanical Ability Tests for Selecting Cotton Mill Workers. T. W. HARRELL, Johns Hopkins University.

Predictive Value of a Teachers Rating Scale and Intelligence Tests. THOMAS B. MEADOWS, Georgia State College for Women.

Variations of the Tetrad Equation. EDWARD E. CURETON, Alabama Polytechnic Institute.

Judging Intelligence from Photographs. C. R. GARVEY, Carnegie Institute of Technology.

The Control of Body Temperature by Suggestion. M. KERSHAW WALSH, University of South Carolina.

An Experiment on Cutaneous Anaesthesia Produced by Hypnotic Suggestion. FRANK A. PATTIE, Rice Institute.

The Modification by Hypnosis of Some So-Called Voluntary and Involuntary Responses and the Relation of Such Modification to the Theories of Hypnosis. ROY M. DORCUS, Johns Hopkins University.

The Nature of Paranoia. ROBERT S. CARROLL, Highland Hospital, Asheville, N. C.

The Mental and Emotional Status of Sixty Destitute Girls. GRAHAM B. DIMMICK, University of Kentucky.

The Significance of an Examination in Psychology as a Test of Retention or of Grasp of Relations. J. B. MINER, University of Kentucky.

The Operational Meaning of Intelligence Quotients vs. *Their Mystical Interpretations.* H. M. JOHNSON, American University.

II. Philosophy Papers

The Basis of Hagel's Epistemology. CONNIE BURWELL, University of North Carolina.

Epistemological Coördination in Lossky's Theory of Knowledge. ALEXANDER S. KOHANSKI, Vanderbilt University.

Masaryk's Relation to Brentano. W. PRESTON WARREN, Furman University.

Undefined Concepts in Postulate Sets. L. O. KATSOFF, University of North Carolina.

Religion and 'Natural History.' FRITZ MARTI, University of Maryland.

Beyond the Biological Point of View in Aesthetic Theory. MARJORIE S. HARRIS, Randolph-Macon Women's College.

The Argument from Motion in Aristotle and Aquinas. ROBERT L. PATTERSON, Baltimore, Maryland.

A Method for the Analysis of Substance. LAURENCE F. KINNEY, University of Virginia.

Aristotle's Theory of Human Reason as Related to His Metaphysics and Theory of Knowledge. B. C. HOLTZCLAW, University of Richmond.

Some Presuppositions of Aristotle's Psychology. GEORGE BOAS, Johns Hopkins University.

The Knowledge and Use of Aristotle Displayed by Nicholas of Cusa in De Docta Ignorantia. ANNA FORBES LIDDELL, Florida State College for Women.

A Review of Aristotelian Aesthetics. HERBERT C. SANBORN, Vanderbilt University.

Aristotelian Causality and Values. LEWIS M. HAMMOND, University of Virginia.

Plato's Philosophy of History. ADAM ALLES, St. John's College.

The Problem of Freedom in the Light of the Concept of Maturation. GEORGE T. KALIF, Tulane University.

Awareness and Inference. MARTEN TEN HOOR, Tulane University.

The Philosophical Aspects of Einstein's Theory of Relativity. EDWARD E. RICHARDSON, George Washington University.

PROCEEDINGS OF THE ELEVENTH ANNUAL MEETING OF THE MIDWESTERN PSYCHOLOGICAL ASSOCIATION

ARTHUR G. BILLS, SECRETARY, UNIVERSITY OF CHICAGO

The Eleventh Annual Meeting of the Midwestern Psychological Association was held April 24 and 25, 1936, at Northwestern University, under the Presidency of Dr. Christian A. Ruckmick of Iowa State University. There were 376 persons registered.

At the business meeting, it was voted to require future applicants for membership who are not in the American Psychological Association, to present, in addition to the endorsement of an M.P.A. member, a statement of their qualifications and publications, if any. Hereafter new members will be voted upon at the annual business meeting only. It was voted not to publish abstracts of papers in the PSYCHOLOGICAL BULLETIN. A memorial to Joseph Peterson was read by H. B. English. It was decided that the 1937 meeting would be held at the University of Illinois, Urbana, Illinois. The following newly elected officers of the Association were announced:

President, 1936–1937, Harvey A. Carr, University of Chicago.

Council Member, 1936–1939, Joy P. Guilford, University of Nebraska.

PROGRAM

FRIDAY MORNING, APRIL 24

SECTION A: PERSONALITY

J. P. GUILFORD, University of Nebraska, *Chairman*

1. *Consistency of Personality Characteristics from Childhood to Adolescence.* R. STAGNER, Universtiy of Akron.
2. *Ideas of Reference as Projection of Self-Criticism.* R. R. SEARS, University of Illinois.
3. *The Behavior of Minority Alignment When Treated as Symptomatic of a General Trait.* T. F. LENTZ and E. NICKEL, Washington University.

4. *Moods of Cheerfulness and Depression Among College Students.* P. T. YOUNG, University of Illinois.
5. *The Generality and Specificity of Attitudes.* V. E. HERRICK, University of Wisconsin.
6. *Further Studies of the Relation of Autistic Gestures to Personality.* M. H. KROUT, Chicago City Junior Colleges.

SECTION B: DEVELOPMENT AND GROWTH

B. WELLMAN, University of Iowa, *Chairman*

1. *Preventing Reading Disability: The Reading-Readiness Factor.* D. KOPEL, Northwestern University.
2. *Studies in the Development of Speech in Two Infants.* A. A. LOW, Illinois Psychiatric Institute. (Sponsored by A. W. BROWN.)
3. *Genetic Studies of Gifted Children.* P. A. WITTY, Northwestern University.
4. *Reasoning in Children.* N. R. F. MAIER, University of Michigan.
5. *The Establishment of a Criterion of Depth of Sleep in Newborn Infants.* I. WAGNER, Ohio State University.
6. *Mental Growth as a Function of Integrated Time.* G. S. SNODDY, Indiana University.

SECTION C: ELECTROPHYSIOLOGY

H. CASON, University of Wisconsin, *Chairman*

1. *Electrodermal Resistance Changes During Certain Types of Attention.* D. U. GREENWALD, Iowa State University.
2. *A Comparison of Brain Potentials in Children and Adults.* D. B. LINDSLEY, Western Reserve University.
3. *Effect of Response on the Latency and Frequency of the Berger Rhythm.* L. E. TRAVIS, J. R. KNOTT, and P. E. GRIFFITH, University of Iowa.
4. *Relations of Palmar Electrical Activity to Learning.* M. M. WHITE, University of Kentucky.
5. *"Nervousness" Now Directly Measurable.* E. JACOBSEN, University of Chicago.
6. *An Electromyographic Study with Respect to Speed of Movement and Latency, Disparate and Reciprocal Innervation, Passive Movement, Attention, and Relaxation.* B. K. BAGCHI, Iowa State University.

SECTION D: PERCEPTION AND INTELLIGENCE

J. P. PORTER, Ohio University, *Chairman*

1. *Figure and Ground in a Pencil Maze.* R. LEDGERWOOD, Southeastern Teachers' College.
2. *The Influence of Relative Visual Angle, Illumination, and Exposure Time on Memory for Visual Forms.* W. C. SCHWARZBEK, Ohio State University.
3. *The Stability of Verbal Configuration.* R. H. WATERS, University of Arkansas.
4. *Low Basal Metabolism and Behavior Reactions.* H. S. SCHACTER, Northwestern University.
5. *The Rôle of the Basal Metabolic Rate in the Intelligence of Ninety Grade-School Students.* R. T. HINTON, JR., Northwestern University. (Sponsored by J. J. B. MORGAN.)

FRIDAY AFTERNOON, APRIL 24

SECTION A: LEARNING

J. A. MCGEOCH, Wesleyan University, *Chairman*

1. *The Significance of Practice and Rest Periods in Motor Learning.* R. C. TRAVIS, Western Reserve University.
2. *The Influence of Twenty-four Hours of Wakefulness upon the Learning and Retention of a Maze Problem in White Rats.* M. E. BUNCH, A. COLE, and J. FREDRICKS, Washington University.
3. *Conditions of Remote Association.* H. N. PETERS, University of Missouri.
4. *A Constant Ratio Between Hard and Easy Aiming During Practice.* E. B. GREENE, University of Michigan.
5. *An Experimental Study of the Speed Factor in Reading Performance.* M. A. TINKER and V. L. ANDERSON, University of Minnesota.
6. *An Analysis of the Interests of College Students in the Content of the First Course in Psychology.* F. L. RUCH, University of Illinois.

SECTION B: FUNCTIONS OF THE NERVOUS SYSTEM

H. B. ENGLISH, Ohio State University, *Chairman*

1. *The Acoustic Value of the Several Components of the Auditory System in Cats.* W. J. BROGDEN, University of Illinois.

2. *Quantitative Aspects of Postural Adjustments in Pigeons with Cerebral, Cerebellar, and Vestibular Lesions.* W. HALSTEAD and G. YACORZYNSKI, Northwestern University.
3. *Brain Mechanisms and Behavior Variability.* I. KRECHEVSKY, University of Chicago.
4. *A Further Analysis of Critical Flicker Frequency.* S. H. BARTLEY, Washington University.
5. *Effects of Cortical Lesions upon the Maternal Behavior Pattern in the Rat.* F. A. BEACH, University of Chicago. (Sponsored by H. A. CARR.)

SECTION C: PSYCHOPATHOLOGY

BURT MINER, University of Kentucky, *Chairman*

1. *A Comparative Study of Psychotic and Normal Prisoners.* A. A. HARTMAN, Institute for Juvenile Research. (Sponsored by A. W. BROWN.)
2. *A Diagnostic Scoring for the Thurstone Personality Schedule.* E. S. CONKLIN, Indiana University.
3. *The Reconstruction of Psychotherapeutic Techniques on the Basis of Type of Problem to Be Handled.* R. LEEPER, Cornell College.
4. *A Constitutional Study of Delinquency.* H. SHUEY, Topeka Boys' Industrial School.
5. *Specific Features of Intellectual Deterioration in Schizophrenia and Organic Psychoses.* W. MALAMUD and E. PALMER, University of Iowa.

SECTION D: APPLIED PSYCHOLOGY

RICHARD HUSBAND, University of Wisconsin, *Chairman*

1. *The Validity of Testing in Public Employment Offices.* L. A. THOMPSON, JR., Cincinnati Employment Center.
2. *A New-Type Rating Scale for Office Employees.* F. A. KINGSBURY, University of Chicago.
3. *An Experimental Study of the Relationship Between Susceptibility to Glare and Vision.* A. R. LAUER, Iowa State College.
4. *Item Analysis II. Further Study of a Test for Forecasting Supervisory Ability.* H. C. TAYLOR, Cincinnati, Ohio.
5. *Some Characteristics of the Tests Used to Predict Clerical Success.* H. A. COPELAND, Cincinnati Employment Center.

FRIDAY, APRIL 24, 8:00 P.M.

SYMPOSIA

Methods of Teaching Psychology: F. C. DOCKERAY, Ohio State University, *Chairman.*

Functions of the Brain: E. A. CULLER, University of Illinois, *Chairman.*

Child Development: F. GOODENOUGH, University of Minnesota, *Chairman.*

Physiological Study of Emotion and Psychopathology: LEE E. TRAVIS, Iowa State University, *Chairman.*

Psychology of Learning: W. HERON, University of Minnesota, *Chairman.*

Highway Safety: A. R. LAUER, Iowa State College, *Chairman.*

Mental Measurement: H. H. REMMERS, Purdue University, *Chairman.*

Logic of Psychology as Science: C. R. GRIFFITH, University of Illinois, *Chairman.*

Reading and Speech Disabilities: TH. G. HEGGE, Wayne County Training School, *Chairman.*

Motivation: P. T. YOUNG, University of Illinois, *Chairman.*

Personality Measurement: E. S. CONKLIN, Indiana University, *Chairman.*

SATURDAY MORNING, APRIL 25

SECTION A: COMPARATIVE PSYCHOLOGY

H. KLUEVER, University of Chicago, *Chairman*

1. *The Behavior of White Rats on a Simple Alternation Problem in a Temporal Water Maze.* S. EVANS, Ohio State University.
2. *Coöperative Behavior in Monkeys and Children.* D. L. WOLFLE, University of Mississippi.
3. *A Study of the Delayed Reaction in the White Rat.* R. GRANEY and O. C. TRIMBLE, Purdue University.
4. *Maze Learning in Water Snakes.* W. B. POMEROY and W. N. KELLOGG, Indiana University.
5. *Attempted Functional Reversal of Substitute and Original Stimuli in Two Different Learning Situations.* H. F. HARLOW, University of Wisconsin.
6. *A Comparison of Color Limens in Primates (Monkeys and Man) by the Use of Pure Spectral Colors.* W. F. GRETHER, University of Wisconsin.

Section B: Aesthetics

J. P. Nafe, Washington University, *Chairman*

1. *Measuring Appreciation of Prose.* H. A. Carroll, University of Minnesota.
2. *A Study of Conditions Affecting the Functioning of the Art Appreciation Process at the Child-Level.* M. D. Voss, University of Iowa.
3. *Evaluating Attitude Toward Poetry.* J. E. Hadley and H. H. Remmers, Purdue University.
4. *A New Procedure for the Study of Creative Imagination, Aesthetic Response, and Form Perception.* N. C. Meier and W. McCloy, Iowa State University.
5. *Reliability of Associations of Known and Unknown Melodic Phrases with Words Denoting States of Feeling.* W. B. Shimp, Ohio University.

Section C: Psychopathology

C. N. Rexroad, Stephens College, *Chairman*

1. *Electrical Resistance and Basal Metabolism in Forty-Six Insane Patients.* W. A. Livingston, Indiana University.
2. *Comparative Study of the Influence of Race and Locale upon Emotional Stability of Children.* F. Brown, Alfred Willson Children's Center.
3. *Optic Pursuit in Normal and Psychopathological Subjects.* H. R. White, Iowa State University.
4. *Recreational Therapy in Prepsychotics.* G. J. Rich, Milwaukee County Mental Hygiene Clinic.
5. *Superior Intelligence in Patients with Fröhlich's Syndrome.* E. L. Schott, Henry Ford Hospital.

Section D: Sensory Processes

J. B. Stroud, Kansas State Teachers' College, *Chairman*

1. *Intensity Level Preferences for Speech in Normal and Hard-of-Hearing Ears.* N. H. Kelley and S. N. Reger, Iowa State University.
2. *The Influence of Temperature and Solution Concentration on Reaction Time to Taste Stimuli (NaCl).* H. B. McFadden, Ohio State University.

3. *Proof That Compared Stimuli Do Not Act as Though Independently Presented.* H. WOODROW, University of Illinois.
4. *Change of Auditory Threshold During Reverie as Related to Hypnotizability.* ARTHUR JENNESS, University of Nebraska.
5. *Vibratory Sensitivity Under Various Psychological, Physiological, and Physical Conditions.* L. D. GOODFELLOW, Northwestern University.

SATURDAY AFTERNOON, APRIL 25

Address: S. W. RANSON, Northwestern University

Subject: *The Hypothalamus: Its Role in Emotional Reactions and Sleep.*

PSYCHOMETRICS

ANDREW BROWN, Institute for Juvenile Research, *Chairman*

1. *A Formula for Correlations Among Multi-Scores.* E. B. ROYER, Oklahoma A. and M. College.
2. *The Relationship Between the Results Obtainable with Raw and Corrected Correlation Coefficients in Multiple-Factor Analysis.* M. F. ROFF, Indiana University.
3. *Verification of the Multiple-Factor Theory by Means of Common Elements.* G. M. COX, Iowa State College.
4. *Factor Analysis of the Reactions of Superior and Subnormal Children.* B. MARTINSON, Fort Hays, Kansas, State College.
5. *Do Marking Systems Based on the Normal Probability Curve Insure an Equitable Distribution of Marks in Elective Curricula?* K. C. PRATT, Michigan Central State Teachers' College.

REPORTS FROM THE LABORATORIES

J. P. NAFE, Washington University, *Chairman*

SATURDAY, APRIL 25, 6:00 P.M.

ANNUAL DINNER

Toastmaster: J. A. MCGEOCH, Wesleyan University

Address of the President: CHRISTIAN A. RUCKMICK, Iowa State University. Subject: *Psychology Tomorrow.*

PROCEEDINGS OF THE FOURTH ANNUAL MEETING OF THE ROCKY MOUNTAIN BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

THOMAS H. HOWELLS, SECRETARY, UNIVERSITY OF COLORADO

The Fourth Annual Meeting of the Rocky Mountain Branch of the American Psychological Association was held on November 29 and 30, 1935, at Colorado College, Colorado Springs, in conjunction with the meeting of the Colorado-Wyoming Academy of Science.

It was decided that a special summer meeting would be held at the University of Wyoming at Laramie during the first week in July of 1936. It was also voted that for the subsequent annual meetings a program containing abstracts of papers to be presented should be printed and made available to members at the time of the meeting.

The following officers were elected for the year 1935-1936: President, Thomas H. Howells, University of Colorado; Vice-President, Robert H. Bruce, University of Wyoming; Secretary, T. R. Garth, University of Denver; Treasurer, Helen Newcomb, Colorado State College of Agriculture and Mechanic Arts.

The following papers were presented:

A Study of the Mental Efficiency of Groups of Varying Degrees of Adjustment. M. A. SKAER and W. A. BLAKELY, Colorado College.

Personality Factors in the Achievement of High School Pupils. L. G. PORTENIER, University of Wyoming.

Methods of Research in Psychology and Education. R. A. DAVIS, University of Colorado.

The Analysis of a Complex of Variables into Principal Components. J. S. JORDON, Colorado College.

Teachers' Attitudes and Child Behavior. D. B. ELLIS and L. W. MILLER, University of Denver.

A Study of Room Resonance as a Factor Affecting the Norms of the Seashore Tests of Musical Talent. S. E. STOTTS, University of Colorado.

The Effect of Varying Time of Water Deprivation upon Performance of Rats on a Runway. R. H. BRUCE, University of Wyoming.

Scholastic Achievement as a Function of Intelligence. M. M. Roos, Colorado College.

Film Showing Twenty-Fourth Expedition to the Indians. T. R. Garth, University of Denver.

Natal Factors Differentiating Between Equivalently Conditioned Sympathetic Responses. J. B. Schoolland, University of Colorado.

Statistical Analysis of Wyoming High School Graduates. W. P. Reed, University of Wyoming.

Taboos of Psychologists. L. W. Cole, University of Colorado.

Apparatus for Measuring Empty Temporal Intervals. W. A. Blakely, Colorado College.

Factors Influencing Honesty in Obtaining School Credits. T. H. Howells, University of Colorado.

SPECIAL REVIEW

PERRY'S THOUGHT AND CHARACTER OF WILLIAM JAMES[1]

BY ROSWELL P. ANGIER
Yale University

One lays down these two fat volumes with the conviction that they offer the definitive account of one of the most entrancing characters of latter day American thought. The ninety odd chapters fall into six main divisions of subject matter: I. *His Father's Son*—an account of the elder Henry James and the intellectual environment of William James's youth; II. *Education and Career*—from early schooling to his resignation from Harvard in 1907; III. *Early Philosophical Orientation*—empiricism, science, and individuals as they affected James's developing thought; IV. *Psychology;* V. *Ethics and Religion;* VI. *The Ultimate Philosophical System.* The whole work is a deft, integrated intermingling of letters to and from James—several hundred of them nearly all never before published—of unpublished notes, and of the author's admirably clarifying text. It is a lively and refreshing intellectual biography. From such wealth of material the reviewer can select for comment only a few salient points that may also interest other psychologists, particularly the younger ones, to whom James may be a respected but unread "classic."

That James was truly *sui generis* is abundantly evident in every chapter. His thinking can be fitted into no traditional molds, and any "authoritative" doctrine was at once suspect to the interrogative temper of his Irish mind. "The book (*Varieties of Religious Experience*) is divinely shameless," wrote a colleague; "God himself couldn't discuss his manifestations with more glorious freedom from self-consciousness." He was a restless, questioning soul, the quintessence of free-lance originality, profoundly human and earnest, holding the deeper problems of psychology, philosophy, or religion in the apt suspension that their seriousness demanded, seeking no premature

[1] Perry, R. B., *The Thought and Character of William James.* Boston: Little, Brown and Company, 1935. Pp. Vol. I, xxxviii + 826; Vol. II, xxii + 786.

"closure" into crystallized system—a truly pioneering mind, to whom life was a cumulative intellectual adventure. "The notion of a 'really growing world' is," says Perry, "the general theme . . . of the *Problems of Philosophy*," a book left unfinished at James's death, and not long before he died James himself wrote, "I've grown fearfully old in the past year, except 'philosophically,' where I still keep young," and "my whole *Anschauung* . . . has been the belief that something is doing in the universe, and that *novelty* is real." "When death brought him down," writes Perry, "he was in full flight."

The Jameses were all an intellectually vigorous and individualistic family—from the first James (William, who migrated here from Ireland about 1800, begot fourteen children, and left a considerable fortune) to the present. Our William's father, the elder Henry James, a robust and dynamic man, gave himself to study and thought, lecturing and writing, and was the center of the lively intellectual give-and-take habitually prevalent in the family. Several deep seated characteristics became equally strong in his son William—a constitutional distaste for orthodoxy, championing the weak and assailing the strong, and hatred of pretense and "bigness" in any form. Profoundly and ruggedly religious, the father became an ardent Swedenborgian, was an intimate of Emerson and his circle of refreshing and unworldly transcendentalists and humanitarians, and a member of the famous Saturday Club, made up of such men as Emerson, Longfellow, Lowell, Hawthorne, Whittier, Norton, Sumner, Louis Agassiz, Richard H. Dana, and Motley. It was in such an atmosphere that William James grew up, and it stayed with him. Its humanitarianism, amelioristic ardor, unspoiled and unafraid curiosity, speculative temerity, tendencies toward the mystical, etc., continued to color his thought and writing, although his preoccupations came to be with physiology, psychology, and "tough-minded" radical empiricism. James spanned, in a vividly personal way, two eras.

The eldest of the four sons and one daughter of Henry James, William was born in New York City in 1842, only a year before his famous brother Henry, the novelist. His schooling was irregular, largely by private tutors, partly in this country and partly in Europe. In 1861, after prolonged hesitation between art or science as a career (he had the painter's eye and gift—much to his father's distress, who thought that art was at best trivial, and at worst, immoral) he

entered the Lawrence Scientific School at Harvard. The family moved to Cambridge, William entered the Medical School, and secured his M.D. degree in 1869. In 1873 he became instructor in physiology at Harvard—where he taught and worked, with many interruptions, until his death, in 1910. His interests, after his initial appointment, shifted more and more insistently from physiology toward psychology. As early as 1867, in his twenty-fifth year, he had written, while still immersed in his physiological and medical studies, "It seems to me that perhaps the time has come for psychology to begin to be a science . . . Helmholtz and a man named Wundt at Heidelberg are working at it . . ." In 1875 he secured permission from President Eliot to give a course in psychology "as a living science." This was a real innovation, and started the teaching of the "new" psychology in this country. The laboratory phase of the work began modestly, to be sure, at the same time—also the first in America.

As early as 1878 James contracted with Henry Holt to write what developed into his greatest single work, *The Principles of Psychology*. This appeared, in two large volumes, in 1890—after twelve years of intermittent toil. James became at once an international figure. The textbook, *Psychology, Briefer Course,* mainly cullings from the larger work, was issued in 1892. These two works—with only three competing texts in America on the new psychology—at once took the lead, and kept it, as the number of books multiplied, for years. Angell's *Psychology* (1904) became the first serious alternative in classroom to James's *Briefer Course*.

Delivered of the *Principles* ("there isn't a page more of psychological literature in this child's mental organism") James turned more and more to the insistent problems of philosophy. But it is a mistake, which some have made, to assume that James the psychologist, was done. He continued to lecture and write on psychological topics, and the basic concepts in his many later philosophical works were permeatingly psychological—and mostly to be found already in the *Principles*. But with that publication his big job in psychology was finished. He was singularly happy when Münsterberg, at James's urging, took over the laboratory in 1892.

James was always subject to intermittent ill health, to periods of depression, made many trips to Europe—often to Nauheim or other health resorts—and, some twelve years before his death, suffered a heart injury from which he never fully recovered. His physical ills,

however, appear but to have accentuated his central spontaneity and the robustness of his out-reaching, "adient" mind. His years of greatest productivity came after his heart injury. To mention only the *books: Talks to Teachers on Psychology* (1899), *The Varieties of Religious Experience* (1902), *Pragmatism* (1907—the year of his retirement from Harvard), *The Meaning of Truth* (1909), *A Pluralistic Universe* (1909), and *Some Problems of Philosophy* (posthumous).[2]

If one asks today's graduate students of psychology what James means to them, some scarcely get beyond a few of his picturesque phrases (the "one great blooming, buzzing confusion" of the babe's world; "we feel sorry because we cry"; "introspective analysis . . . trying to turn up the gas to see how the darkness looks"); others may know a bit about some of these: *habit, the stream of consciousness, the self, the emotions, the five types of decision, does consciousness exist, on a certain blindness in human beings, the energies of men* or, possibly, his pragmatism, functionalism, radical empiricism, or anticipations of Gestalt. But they will not know much. And yet they have absorbed James indirectly throughout their reading. For he was chiefly interested in concepts, ideas, fecund points of view, scattered, often as incidental remarks, carelessly like a sower—ideas that have become so much part and parcel of our psychological literature that authors naturally omit the name "James." They have dropped the pilot, but still follow his chart.

James was the first—and probably the last—to attempt to picture from the scientific angle the state of psychology *entire,* and this at a time (as Perry makes clear) when philosophy, sensing a losing grip on psychology, struggled in the lists with sense-physiology, psychological experiment "as such," and the functional movement developing from Darwinism. At such a time, from one as empirically sensitive to existent conditions as James, his *Principles* could not choose but be a somewhat unsystematic *mélange* of metaphysics, biology, experiment, and acute "arm-chair" observation. "I *am* too unsystematic and loose . . . deliberately," wrote James to the tight-thinking Ward, "on account of the strong aversion . . . for the humbugging pretense of exactitude . . . in psychological literature." James really "exhibited" psychology in all the germinal mixed-up state in which it existed. This—with the brilliance with which he

[2] In an *Annotated Bibliography of the Writings of William James* (Longmans, Green & Company, 1920) Perry lists some three hundred titles.

did it—is largely what makes the book a classic, and differentiates James from others—notably Wundt—who wrought more as exploiters (" with pretense of exactitude? ") in the interests of system.

The *Principles* was received by James's colleagues of 1890, here and abroad, with mixed judgments, which Perry well portrays. " You have read it? " asked Lincoln Steffens of Wundt, after loaning him his copy of the book, just out. " 'All night long,' he replied. ' word for word, every word. It is literature, it is beautiful,' he stammered, ' but it is not psychology.' " Carl Stumpf wrote, " You have written the best of all psychologies." " *Une oeuvre glorieuse,*" exclaimed the *Revue Philosophique*. Sully, the English writer of successful textbooks, felt that James had " done the big thing." Stanley Hall, James's pupil in the '70's, wrote, " . . . after all the best work in any language." George Santayana (James's younger Harvard colleague, in thought and temperament antipodal, but with singular capacity for objective empathy) gave the most temperate and balanced review (Perry, II, 110 f.) saying *inter alia*, " He is eager for discovery, and conscious that too little is known for any final or comprehensive statements . . . it would be pendantry to regret the loss of logical unity in a book so rich and living, in which a generous nature breaks out at every point, and the perennial problems of the human mind are discussed so modestly, so solidly." Boring in his *History* (1931), viewing the psychology of the '90's through the perspective of forty years, writes, " There can be no doubt that James is America's foremost psychologist " (and in his index more references are made to James than to any psychologist except Titchener and Wundt).

With the well-nigh universal praise there were, however, many contemporary " buts." Chief were the lack of system in the *Principles,* and the befogging effects of its brilliant and picturesque style. In the review already quoted Sully complained that the work had " no general plan " and so much " dazzling effect " of style as to blur " the sharp outlines of scientific thought," and looked askance at the " rollicking defiance of the authorities." The absence of system and the jousting at authorities was, of course, the general cavil of the systematizers. But the point about style has persisted. Many say today that James's picturesqueness of style has retarded the progress of psychology. Well, one answer lies in a comment quoted by John Dewey as a summing-up of Sully's review of the *Principles,* " a good book, but too lively to make a good corpse, and every

scientific book ought to be a corpse." James still lives; Sully, and others? James's own reply might be inferred from his comment on Ladd's *Psychology*. It was tedious—"tedious not as really hard things, like physics and chemistry, are tedious, but tedious as the throwing of feathers hour after hour is tedious." In reality James did a service in presenting the just born "new psychology," in all its random effort, with arresting felicity of style. (And isn't felicity of phrase only a "conditioned reflex" anyway, clear enough to the imaginative?) At any rate James's pungency operated to instigate experimentation; if only as a bur under the saddle, James would have been specially delighted, for in spite of the vehemence with which he proclaimed his views he seldom omitted the happy question mark. At the end of his boldly "rollicking" and provocative chapter *The Emotions* (which, according to Watson was "a check from which it [the psychology of emotions] has only recently begun to recover," which none the less helped to point certain widely quoted experiments of Sherrington, Cannon, and others) James added in its first formulation, 1884, "The best thing I can say for it (the theory) is, that in writing it, I have almost persuaded *myself* it may be true." A paradigm almost worthy of marble.

Well, a present-day student might appropriately ask, what *are* some of these ideas, germinal points of view, which (abstracting from James's attractive way of putting them) have become woven into the warp of our psychology? Says Perry (II, 668), referring to James's thought in general, not merely to psychology: "If we compare the year 1935 with the year 1885 in which James may be said to have come of age, and plot the movement of the human mind and spirit during this half century, it is remarkable how much of James falls on the line. The attention to 'experience'; the free intermingling of psychology and philosophy in the study of perception, thought, and other forms of knowledge; the revolt against the dualisms of subject-object and of body-mind; the passing of scientific dogmatism, in both its mechanistic and its evolutionary forms; the empirical study of religion, and the tendency to ascribe noetic value to the mystical consciousness; the rise of the theory of value; the recognition of the emotional and other personal contaminations of thought; the dethroning of the Absolute and the decline of all forms of extreme monism; indeterminism; the stream of consciousness; the clinical approach to psychology, with its emphasis on personality and on the unconscious; the rejection of associationism,

together with the emphasis on integral motor response, and on the organic unity of the conscious field; the development of applied and of social psychology; relativity, in all its wide range of meanings—these are some of the ideas whose vogue would make it quite possible for James to breathe the air of the present time, and whose proponents find it natural to quote him."

In psychology itself James contributed the "functional" point of view so that it *took;* Ladd's discussion of it at the philosophical level did not take. From this substitute for the prevailing, rejected "elementarism" issued mental tests and Behaviorism—and the later explicit Functional-*ism.* James's insistence on the significance of the motor aspects of experience and on the permeating rôle of biology and neurophysiology, new in American psychology, likewise did much to make the later Behaviorism possible. The "novelty complex" of Gestalt psychologists would, too, have experienced beneficent *Abreaktion* if they had read the almost verbatim chunks of Gestalt embedded in the *Principles.* The *Stream of Thought* motif running through all of James's work served, because of its sharp antithesis to everything elementaristic, as a powerful challenge to Structuralism to bulwark its systematizings. The remaining modern "system"—psychoanalysis—alone developed, as a specialized formulation within the general frame of psychopathology (the import of which for psychology James did much to advance), unheralded by James. But, meeting Freud in the last year of his life (1909) James's still flexible sympathy for the promising led him to say in a letter (although "I strongly suspect" Freud of being "a man obsessed"), "I hope that he . . . will push it (dream theory) to its limits, as undoubtedly it covers some facts, and will add to our understanding of 'functional psychology,' which is the real psychology." (On the same day James met Titchener for the first time—"who made on me a very pleasant impression"—and added, in the same letter, "Apart from that . . . keeping the laboratory instruments going . . . it ['scientific' psychology, 'structurally' considered] . . . is a pure will-of-the-wisp . . . more unreal than any scholasticism.") So much for James vs. the modern *schools.* It seems fairly apparent that his positive ideas are in various forms still working; those that drew his criticism have pretty much had their day.

Further, more specific, points might be mentioned (*e.g.* James initiated in America the work on transfer of training; Thorndike did his first animal experiments—on chicks—in the basement of

James's Cambridge house), but enough has been said about James's significance to whet the appetite, the reviewer hopes, of younger psychologists to know their James. A much better appetizer would be to dip into Perry's volumes.

James was not an experimenter. Nor did he deal in the "reliabilities" and "validities" that were just coming over the horizon—he never felt at home with mathematical quantifications and highly approved a student's statement that "algebra was a low form of cunning." For experiment he had not the patience, and he was temperamentally more interested in *ideas*—in starting them on their way, after doing his own best with them, for the really equipped to follow through experimentally. Says Boring, ". . . James . . . formulated a psychology which could become a frame for experimental work, as the act psychologies of Austria, Germany, and England could not." It is a great mistake, one frequently made, to think that James himself was opposed to experiment. His deeply rooted empiricism, his pragmatic cry for facts, demanded the laboratory. That he valued it highly Perry makes abundantly clear, as does James's *Principles*. The mistake originated in the many delicious diatribes scattered through his writings, not against experiment, but against the *experimenters* of his day. Most of their work, he thought, was trivial, and they had lost perspective; they were too cocky and pontifical. "The results . . . from all this laboratory work . . . grow more and more disappointing and trivial. What is most needed is new ideas. . . . I fear that in a few years, if nothing more significant in the way of ideas emerges from it all, there may be a reaction which will make trustees repent of their enterprise in founding laboratories." On the other hand James writes at about the same time, the early '90's, "The man who throws out most new ideas and immediately seeks to subject them to experimental control is the most useful psychologist. . . ." "Helmholtz," says Perry, "was one of his [James's] scientific idols." Because, of course, he both had ideas *and* could experiment. Writing Stumpf, James remarks, ". . . the experimental patience, and skill, and freshness of observation of the Helmholtzes and Herings are altogether admirable, and perhaps at bottom *worth* more than philosophical ability." Aptly enough—as evincing James's dual attitude towards experiment, this passage occurs in the same letter as his delectable *Auslassungen* on Wundt (". . . the most praiseworthy and never-too-much-to-be-respected type of the species. . . . He is not a genius, he is a *professor* . . ."). If James were alive today he would be the first to acclaim those

accomplishments of the laboratory that have flowed from real ideas. But he would be more interested in the men with the generating ideas than in those who work them out.

The reviewer has purposely confined himself chiefly to those parts of Perry's book that deal with James the *Psychologist* and has thus done scant justice to the total picture of him that Perry has drawn. But any review would be seriously at fault that did not mention, however haltingly, the primary theme that runs through all of James's thought—his psychology, his ethics, his philosophy—namely, his deep-dyed *empiricism*. "As his central insight," says Perry, "it inevitably finds expression in his ultimate metaphysics."

Although tortured by ultimate philosophical problems James by nature always dwelt close to fact. That is why he entered physiology instead of art. In thought he rooted deep in John Locke and the other British Empiricists. The ultimate test of any knowledge, any hypothesis, however abstract, always *terminated in* (a phrase straight from Locke) "brute datum," at the felt, perceptual level. This constitutes, said James, "the lasting truth of empiricism." But the elder empiricists did not go far enough—not even the bold Hume. James fills the gap in their thought. They failed, felt James, to solve their problem because they were not empirical enough. But for the accident of intervening years James would take his place as the last of the British Empiricists—as the solvent of Hume.

Hume and the others had simply assumed as an unquestioned postulate that "ideas" are disconnected. How, then, can they get connected? The empiricists had no real answer. ". . . all our distinct perceptions are," wrote Hume, "distinct existences, and . . . the mind never perceives any real connexion among distinct existences. . . . For my part . . . this difficulty is too hard for my understanding." And there seemed, indeed, but three ways out. First, to get a connected world by introducing a God to hold the parts together (Berkeley); second, by the intervention *ab extra* of intellect (Kant *et al.*); or third, the postulate—so neatly stated by Hume—was wrong. James said it was wrong, and the attempted answers of Berkeley and Kant therefore irrelevant. "Hume can be corrected and built out . . . by using Humean (empirical) principles exclusively, and without the circuitous and ponderous artificialities of Kant." James indeed felt—after years of struggle with the postulate that had dominated thought since Locke—that he had cut under the whole massive superstructure of idealistic philosophy.

The answer lay, indeed, and simply, in his psychological chapter

on the *stream of thought*. The stream of consciousness is an *experiential* continuum—the "substantive" parts (the "ideas" of Locke and Co.) along with the relations between these (James's "transitive states" of the conscious stream). There is naught more certain than that consciousness is continuous and also a plurality of parts. Terms are experienced in *felt* relatedness. Both are of the "brute datum." James thus thought that he had saved the "relatedness" for empiricism, as well as the parts related. The Humean dilemma had been solved (and by "Humean principles exclusively"), the ghost that haunted the Kantians laid. Those interested in tracing how this empirical insight of James molded his *pragmatism*, his *humanism*, his *pluralism* and his *radical empiricism*—as well as his psychology—will find it unusually well portrayed in Perry.

He will also find there, with much else, a discriminating analysis of the rôle that the demands of belief and faith played in James's concept of truth—how he accorded them criterial validity equal to that of theoretical or logical demands, but only when the latter came, by failing to "terminate in" perceptual proof, to a dead end (as in the problem of the freedom of the will, etc.); how, in particular, only after satisfying himself that he had answered Royce's philosophy of the Absolute (which greatly fascinated him) at the level of his empiricism did he invoke the arguments of faith and the moral demands of mankind to refute it—and give us some of his most eloquent, as well as most exquisitely ironical, passages. It will also be clear that James's attitude toward faith, belief, religion, is founded in just his uncompromising empiricism; it is their experiential pervasiveness and stubbornness in human beings that make them to him valid criteria of truth.

It was James's far-flung "experiential" sensitivity that renders him so fascinating. At one extreme the baffling mystery of things, ultimate metaphysical problems, always beckoned him. At the other, few were more alive to the daily solicitations of sense or to ordinary human concerns. In his thinking—however tenuous and abstract—he craved the consummatory "brute datum"; in his living, the vivid feel of concrete reality. He was thus intensely human and social. The casual acquaintance, the convivial group, pure nonsense and repartee, or a twilight metaphysical wrangle with Royce—across the fence that separated their houses—over Royce's intimate friend the Absolute, all these were food and drink to him. Humor and wit were with James no mere side issues, or saving necessities, but spontaneous outcrops of his essential nature. In the family circles "laughter," writes Perry, "was a major activity."

It is this vibrant personality—so evident in his writings and from Perry's volumes—that chiefly impressed those who knew or casually met James. It is difficult to picture him as "lolling" in a chair. "Former students," says Perry, "use such expressions as 'crisp,' 'unexpected,' 'vivid,' 'delightful,' 'alert,' 'exuberance,' 'brilliancy and originality,' in characterizing their classroom impressions." To the reviewer James's vivacity, gusto, unconventionality, and unexpectedness are the most vividly remembered characteristics. One day he met James walking across the Harvard yard with his customary resilient step, dressed in striped trousers, a loose fitting, brown Norfolk jacket, and some sort of bright necktie. James passed by, then hesitated, pivoted about perilously on one foot, put out his hand and said—with a kindly but whimsical look in his eye—"I don't believe I've congratulated you on getting your Ph.D. You've probably read what bosh I think it all is—but I congratulate you." And with that, swinging on his way. One never knew; he might ask about your aunt, or pop out a question as to what you thought about the relation of a thought to its object. Entering his house one afternoon, where his wife was giving a tea, and meeting in the hall a perplexed looking student, he said, "*I* hate these teas too; here's the back way out"—and hustled him out through the kitchen. Next day the boy apologized to Mrs. James for not being able to get to her tea. On one occasion he tiptoed—with illusory quiet and stealth—in business suit, removing a silk hat as he came, into Royce's morning class, listened to the arguments for the Absolute, and then quickly departed—to continue the discussion, he and Royce, outside on the steps. It is said that he was once reprimanded by the Department for applauding a Ph.D. candidate's exposition of his subject at the oral examination. One evening at a lecture by the venerable General Booth, founder of the Salvation Army, in the crowded University Theatre James, becoming more and more impressed with the simple, fervent talk, leaned further and further forward in his seat, as if "on his mark," and at the end drew all eyes to him by being the first and the most vigorous in his instant applause.

"You have read today's chapter," he remarked to his large introductory course in psychology, from a favorite seat on the corner of the platform desk. "I wrote the book and what *I* think is all there. But perhaps there is a question?" He could scarcely give a systematic lecture, and there was often much fumbling about as if he were wondering what he might catch himself saying next. But if the intelligent question came or if, more likely, some moot point

occurred to James himself, he would become all alert and develop it so that one did not forget—with much wealth of fact, the aptest of illustrations, giving the "cons" with great fairness and completeness, his own "pros" with clarifying cogency and ardor, delighted if someone questioned his soundness, and quite content—although with perhaps a speculative how-can-you-think-that-way look in his eye—if you ended by disagreeing with him. In his advanced class in metaphysics it was of course always open season on Bradley's or Royce's *Absolute,* but very sportsmanlike gunning. On one occasion, says Perry, when James was to criticize Royce he fell ill and Royce took his place. One can imagine the mischievous glee with which Royce got hold of James's copy of Royce's *The World and the Individual* and read to the class some of James's spirited marginal notes, among which are to be found "what an ass of a realist" (opposite a Roycean statement of what a realist might say), ". . . what is gained by Royce's vague and floundering account," "Bah! what silly quibbling."

Perry's book is not only definitive on James. In reading it one feels that one has actually lived through the significant thinking of two or three generations—from the literary speculativeness of the Emersonian period to the present century of conditioned reflexes, multiplicity of laboratories, mental measurements, and psychoanalytic discomforts. Perry has sympathetically followed James through, with himself in the background, James in the foreground, with the slowly maturing thought of James—his gropings, flashes of insight, reconsiderations, sensitivities to others' thinking and his vigorous reactions to it—as his main theme. The committee of award has certainly honored itself in giving Perry the Pulitzer prize in biography for 1935.

STERN, WILLIAM, *Allgemeine Psychologie auf personalistischer Grundlage*. The Hague: Martinus Nijhoff, 1935. Pp. xxviii+831.

The appearance of a work on general psychology by Professor William Stern is an event of more than passing interest. In the first place, it is a rare treat to find someone who is daring enough to write a psychology which is really "general," *i.e.* which attempts to view the fundamental problems of psychology in the perspective of a consistently maintained and clearly defined point of view which does not evade all difficult issues on the ground that discussion of them may confuse the elementary student. In the second place, there are few men alive who have contributed as significantly in as many fields of psychological research as has William Stern, and who have at the same time retained a vital interest in the systematic problems of the science. And, finally, the production of a compendious work during a period in which the normal uncertainties of life have been immeasurably enhanced is an achievement which commands admiration. Few readers of the book will realize the strain under which it was brought to completion or appreciate the quiet heroism of its author.

Allgemeine Psychologie is organized in six main divisions: Orientation; Sense-perception; Memory; Thought and Imagination; Motivation and Performance; and Feeling. A bibliography of approximately eight hundred titles is appended. The book is designed to offer the serious reader a systematic survey of the most important problems of general psychology. The day has long since passed when any such work could pretend to be complete, and Professor Stern has not hesitated to select. It is possibly a virtue of the personalistic psychology, however, that its principles of selection are elastic, and we have in consequence a fair cross-section of the most recent developments in each of the aforementioned fields. The outstanding gaps, as one might have predicted, are to be found in those areas of research which have been settled principally by American investigators. The word "rat," for instance, does not occur once in the index, and the physiological problems of sense organ, nerve muscle and gland are considered only where they have direct bearing on the experience and behavior of the individual as

such. Both the references within the text and the bibliography at the end are naturally weighted in favor of German psychology.

In the evaluation of a work such as this, however, stress should be laid not on what has been omitted but rather on what has been included. The significant contributions of the book consist, it seems to the reviewer, first in that it presents for the first time in systematic form psychology from the personalistic point of view, and secondly in its fresh and brilliant treatment of certain problems of contemporary research. In the field of sense-perception, to select one example, the view of the sense-modalities as clearly distinguishable and fundamentally discrete types or compartments of sensation is rejected. Since the days of Aristotle the differences between colors and sounds have been stressed to such an extent as to obscure their similarities. For Stern it is equally interesting, and from the theoretical point of view more important, that a particular color and a particular tone may be equal in brightness than that they should be unique, one in the possession of a hue and the other in the possession of a pitch. He claims, in fact, that there are intersensorial modes of appearance which are quite as primary and quite as unitary as the modes of appearance specific to any sense-modality. Spatiality and temporality are presented, accordingly, not as forms of sensory integration but rather as modes of phenomenal organization which are fundamental to all sense-perception, which are, in other words, imbedded in the structure of the experiencing person.

The concept of the experiencing person is naturally fundamental to the whole discussion. A person is defined as "an individual, unique totality which functions in a goal-directed manner, is characterized both by self-reference and by contact with an objective world [*Weltaufgeschlossenheit*], lives and experiences." Psychology as such is concerned primarily with the last of these characteristics, *i.e.* with experience and with the dispositions which underlie experience. The science of persons, or personalistics, extends much farther. A person is a psychophysically neutral entity. It belongs to a level of existence which is neither material nor psychical, but which constitutes the substrate of all psychical life. All psychical phenomena must consequently be viewed against a background of life-function from which they emerge and to which they always bear meaningful reference. It is natural that the personalistic psychology should accord the problem of development a central position. The very fact of experience implies that the relative quiescence of merely biological existence has been disturbed, that the neutral person is reaching out

in two directions, on the one hand toward objectivity and on the other toward subjectivity. Subject and object are, then, not independent existents from the relationship between which perceptions, desires and thoughts are created. They represent, rather, directions of differentiation out of a pre-objective and pre-subjective state. Development is always toward a pure thing-in-itself and a pure ego, but the goals are never reached. In cognition and volition the severance of subject from object is most highly developed; in feeling we experience the first stage of differentiation out of the neutral totality of life process.

The implications of a developmental approach such as this are challenging. This is not the occasion, however, for an evaluation of the personalistic point of view. Its fruitfulness has already been demonstrated by the productivity of the Hamburg Institute. The present book is designed not to give final answers but to point issues. As such it constitutes one of the most significant publications of the year. It will be understood best by those who have been trained in the German tradition. It is needed most, however, on this side of the water.

R. B. MacLeod.

Swarthmore College.

Melton, A. W., *Problems of Installation in Museums of Art.* Washington, D. C.: Publications of The American Association of Museums, 1935, New Series, Number 14. Pp. vii+269.

Dr. Melton's monograph, as its title suggests, is an attempt to bring scientific research to the aid of directors of museums of art. Its method is to study the behavior of visitors in museums, and to evaluate different methods and types of display in terms of a particular variable of their behavior, namely, the interest in the exhibits as shown by the number of them examined or the length of time spent in examining them. The educational aim of museums is regarded as paramount in importance; and the interest of visitors in museums is considered to be an index of the educational value of the latter, since it measures their appreciation of the objects exhibited and the development of their aesthetic capacities, as well as the possibility of permanent influence of the exhibits upon their lives. Two dimensions of interest are recognized, namely, spread (the number of objects looked at) and duration (the time spent in looking at them). The following measurements were employed: "room-time," the length of time the visitors spend in the gallery doing things in

some way relevant in looking at the exhibits; "object-time," the actual time spent looking at the exhibits themselves; the number of objects (usually paintings) examined; and the average time per object examined. The first three of these measures show a fairly high correlation with one another. The time spent on each object examined, however, seems somewhat independent and remains constant in the presence of conditions which affect the other measures. Precise definitions were formulated, and the observers were instructed and trained in the use of the measures defined. Records of the routes of the visitors through the museum were kept on routing charts, a device which served also as a record of the number of objects examined. Conceding the difficulty of defining interest as a subjective state, the author considers that, for his purpose, he may regard the number of exhibits examined and the time spent in examining them as *the* real interest of the visitor. Since it was not feasible to follow visitors throughout the museum, mass rather than individual statistics were employed. That is, different populations were observed and their average tendencies compared for the different phases of the experiment. This method required careful study and equalizing of the populations with respect to their normal interest levels. By special studies the author found, for example, that Sunday visitors display lower interest than week day visitors both in time spent and number of objects examined. Visitors who attend exhibits in winter months show on an average a higher interest than summer visitors. The population coming to see an exhibit which has been on display a long time show a lower interest than those coming to see it during the first few weeks. In some exhibitions there was the rise of average interest just before the display was removed. Where such variables could not be controlled experimentally they were carefully allowed for in the interpretation of the results. Since the observation of visitors who came in pairs or groups involved many difficulties and sources of error, it was decided to observe only unaccompanied visitors. This decision was made, however, only after an investigation which showed that, in the frequency of their various degrees of interest and in the proportions of their interest in specific objects, accompanied and unaccompanied visitors behaved essentially alike. This research has a unique value in the study of multi-individual behaviors in that, unlike most investigations in this field, it gave an opportunity for experimental control of situations employed.

The author's first problem, that of determining the effect of the location of the exhibit upon the interest of the visitors, was conducted

in the Flemish-Dutch gallery of the Pennsylvania Museum of Art. In the middle of one end of this gallery was the entrance, and symmetrically placed in the opposite end were two exits. The observations showed a continuous decrease in the number of pictures looked at and average length of time of looking, passing around the gallery from the right of the entrance toward the left. This effect was found to be a result of two tendencies: first, the fact that most visitors (66% to 81.6% in various groups) turned to the right upon entering the gallery; and second, the fact that, between the points of entrance and exit, visitors showed less interest in the exhibits as they approached the exit. Many of the visitors did not complete the tour of the exhibits, but either passed out of one of the exits or turned back toward an exit before they had made a complete circuit. Objects along the shortest route from entrance to exit received the greatest attention; and the amount of attention received by an object was a function of its distance from the exit or exits. The author elaborates a theory of the "exit gradient" which states that, through the attraction-value of an exit for the visitor, the visitor's interest in the exhibit decreases in direct ratio to the proximity of exhibits to the exit. The exits thus "compete" with the pictures, both by diminishing attendance of visitors in certain parts of the gallery and by decreasing interest in pictures displayed in sections where they do attend. For the individuals who turned to the left on entering the gallery, the objects to the immediate *left* of the entrance received greatest attention, and the interest decreased correspondingly as the exit was approached along the left hand wall. These effects were also found in a study of visitors at an exhibit of highway transportation, and in the result of opening an exit in a small art gallery where none had previously existed. The latter experiment was striking in that the fairly high interest shown previously to the opening of the exit was almost abolished. Studies of asymmetrically placed exits further confirmed these findings. Dr. Melton points out that the effectiveness of different locations of a gallery for the exhibition of pictures may vary as much as 100%.

The tendency of an individual to turn to the right was found capable of experimental control by signs. It was found that by the use of an appropriate sign in the form of an arrow flush with the entrance, with words directing the visitors to the right, practically all the visitors could be turned in that direction. Ninety per cent could be turned in a similar manner to the left.

The author's second problem was the effect of increasing the

number of exhibits in a gallery. Starting with 6 paintings in a moderate sized gallery in the Pennsylvania Museum of Art, successive groups of 6 were added, for equal observation intervals, until there was a total of 36, and the average interests shown by groups of visitors under these various conditions were compared. The time spent in the gallery increased for the first two of these added installations (that is, up to a total of 18 pictures), but thereafter remained practically constant. The increase was greater for the week-day than the Sunday visitors. The increase in number of pictures looked at, however, continued up to the point of maximum crowding, though it increased less rapidly toward the end than at the beginning. If the painting-time rather than the gallery-time is taken, there is an actual decrease after 18 pictures are installed. Hence in the more crowded conditions there is a shorter time spent in looking at each picture, and a longer time spent in looking around the gallery and other relevant behavior. The visitors, in short, see more paintings when the gallery is crowded, but they do not spend a longer time in the gallery. It was found that the upper row of pictures (above the eye level), which had to be added as the crowding increased, received a much smaller degree of interest than the lower rows. Considering specific paintings, it was found that nearly all of them were examined with diminishing frequency after the first two added installations, that is, after more than 18 were displayed.

In an effort to find the effect of crowding upon "museum fatigue" an experiment was planned in the single-galleried, 69th Street branch of the Pennsylvania Museum of Art. The wall space around this gallery was divided into 11 experimental sections, and the pictures hung in each section were selected, so far as possible, so as to be equal in character and intrinsic interest. Three experimental conditions were employed. In the first, 4 of the pictures were hung in each section, in the second, 8, and in the third, 12. Only those visitors were used for the record who passed from right to left around the gallery. All measures of interest, for all three experimental degrees of crowding, showed a fairly constant decrement from the first to the eleventh section of the gallery, the amount of interest shown in the end being approximately two-thirds of that shown at the beginning. It was found that these three curves of decrement, for the degrees of crowding, converged slightly toward the end of the tour. "The rate of diminishing returns from increases in number of paintings exhibited decreased steadily as the amount of antecedent activity of the visitors in the museum increased."

The final problem was an effort to answer the question whether a combination of paintings and furniture in the usual period-style display increased or decreased the interest which would be shown in the paintings or furniture if they were exhibited separately. In a small gallery of the Pennsylvania Museum of Art a composite room-display of 18th century English pictures and furnishings, from Tower Hill, London, was set up. Interest in the objects of this situation was compared with that shown when the furniture was removed, and also when the paintings were removed and the furniture left. In still another situation the paintings, without the furniture, were increased in number from 7 to 11. The added paintings were all appropriate to the period and style displayed. It was found that the paintings detracted interest from the furniture and vice versa. Paintings detracted less from other paintings than did the furniture. If the paintings and furniture had been placed in separate rooms, more of them would have been examined than when exhibited together. Comparable results were obtained in a similar study conducted in a 'neutral' gallery, in which there was no attempt to reproduce an ensemble characteristic of any historic or cultural period. The author concludes that whatever the values of composite display may be (such, for example, as the teaching of cultural history, or the provision of a restful change from a sequence of formal galleries), that effect does not operate to make the visitors pay more attention to the objects displayed, but rather to the contrary. This fact may be due, as he suggests, to the low historical or cultural education of the average visitor. As far as the experimental results are concerned, Dr. Melton concludes that all objects exhibited in a gallery compete with and detract interest from one another; and this holds when both objects are of different types (*e.g.* furniture and paintings) as well as when they are of the same type. It holds also whether the different types of objects are exhibited in a unified cultural setting or as a meaningless, heterogeneous collection.

The final chapter is an able application of the author's findings to the problems of museum installation, and to the critical examination and correction of stereotypes previously employed by museum directors.

The reviewer feels that the author of this work has performed his particular task carefully and well. He has used scientific cautions in the controlling of his conditions and the interpretation of his data, and he has presented his results with admirable clarity. In the appli-

cation of psychological techniques to problems of museum direction, this research will stand as an important pioneer effort.[1]

FLOYD H. ALLPORT.

Syracuse University.

COLE, LUELLA, *Psychology of Adolescence.* New York: Farrar and Rinehart, 1936. Pp. xvi+503.

This book is introduced with data from the 1930 Biennial Report of the Department of Education and from the 1930 general census to show that adolescence "is something new under the sun." As evidence that it is new, statistics are presented on recent increases in high school and college enrollments and on near-current changing per cents of boys and girls at each age between ten and twenty-one years who are married or who are working. "With economic pressure working from without and the ideals of democracy (public education for all) working from within, there has emerged the first universal, compulsory period of adolescence the world has ever known." Primitive peoples are denied a period or stage of adolescence. Thus, the term as used in the introductory chapter apparently refers to the unmarried, economically dependent, school population of teen-age. Later, however, the term is used to indicate a stage of growth and development.

In the main part of the book the following aspects are treated: the average adolescent—physically, emotionally, socially, intellectually and morally; the "normal" adolescent, the delinquent, the mentally inferior, the mentally superior, the neurotic, and the vocationally maladjusted; the adolescent's adjustment to his world—his family, his school, his church, his friends, his job, and his community; and finally, the criteria by which one can know when adolescence has ended and adulthood has begun. Since the book was written "to present a relatively comprehensive picture of the adolescent years" with "only objectively proven facts" plus interpretations to show their practical usefulness to teachers, it is well to consider specifically some of the material with reference to these aims.

The reader is introduced to Chapter II, Physical Development of Normal Adolescence, with the statements that "Every structure

[1] It is impossible in this place to deal critically with the methodological implications of this research, for they are too far-reaching. The reviewer is preparing for publication elsewhere a criticism and a re-interpretation of Dr. Melton's findings, discussing them as manifestations of the behaviors of individuals in multi-individual situations, and showing their relation to the J-curve hypothesis of conforming behavior.

has its own growth rate and goes ahead with its particular mode of development, without much attention to the growth rate of any other structure" and that ". . . lack of balance among bones, muscles, glands, heart, lungs, brain, and viscera is the basis for much of the misery accompanying growth throughout this period." The first statement is true with respect to cancer-cell growth but is not an objectively proven fact with respect to the aspects considered in the chapter, namely, skeletal, muscular, glandular, digestive, circulatory, and respiratory growth. This chapter cannot be relied upon to give teachers an understanding of ". . . the physical basis for the clumsiness, malcoördination, emotional outbursts, restlessness, and irritability that characterize the boys and girls in their classes." There is no convincing evidence that bone growth sometimes proceeds so rapidly in contrast to muscular growth that "growing pains" occur. (This concept of growth-pains has been in the literature so long that it is coming to be accepted as a truism.) Neither is there evidence that the skeletal and muscular systems are in such a rapid state of change during adolescence that the individual is unaware of their dimensional increases and hence ". . . knocks over things when he reaches for them because his lengthened legs get him toward objects before he expects to arrive." Indeed, we know little about motor ability or "coördination" of adolescents since studies of such are few. Mention may be made, however, of a study which does not support Cole's contention. Dimock,[1] employing a battery of tests to measure "agility, balance, control, flexibility, and strength" of two hundred adolescents over a period of years, reports that coördination increases throughout the adolescent years.

In the discussion of the circulatory system much is made of a disparity in width of heart and width of its arteries as a factor in adolescent heart strain. The argument for the alleged significance of the disparity in growth rates in this system rests upon Vierordt's (1906) report (1) that the heart grows faster than the arteries and hence must pump blood into an opening which is relatively smaller than it formerly was, and (2) that the blood volume has increased so that during adolescence about 7,800 c.c. of blood must be pumped into the aorta per minute. According to Grollman,[2] however, even a normal full-grown adult has a cardiac output of only 3,900 c.c. per minute.

[1] Dimock, H. S., A Research in Adolescence. I. Pubescence and Physical Growth. *Child Develop.*, 1935, **6**, 177–195.

[2] Grollman, A., *Cardiac Output of Man in Health and Disease*. Baltimore: Thomas, 1932. Pp. xiv + 325.

A case study of an athlete is given as further evidence that the heart is under severe strain during the period of adolescent growth, causing faintness, dizziness, palpitations, headaches, and restlessness. The author states, "It goes without saying that the adolescent heart suffers chronically from the overstrain of athletics." It would be enlightening to know the incidence of heart failure or even heart weakness actually caused by participation in high school athletics.

According to Cole, the development of the respiratory system (lung growth) ". . . is best shown by the lung capacity." Respiratory physiologists, however, do not subscribe to this belief. Christie,[3] for example, concludes from investigations of vital (lung) capacity that variations "are purely fortuitous in nature, even under carefully controlled conditions on one individual." Schneider,[4] another authority not quoted in the section, found that a major factor in breathing tests is the power of the abdominal and other exspiratory muscles.

Further exploitation of the field of physical and physiological development may be seen in the following quotations from the discussion of the digestive system: "The digestive difficulties characteristic of the period are doubtless due partly to the mere overloading of the system and partly to the difference in growth rate between stomach, liver, intestines and other digestive organs," and "The digestive troubles of most boys and girls could be explained on the basis of diet alone." Granted that digestive disorders may be a characteristic of adolescence, diet and differences in growth rate of the digestive organs are not adequate to account for them. In any list of possible causes of digestive difficulties, the well-known relationships between emotional status and digestive functions should be included.[5]

Acne vulgaris, a syndrome which is very important during adolescence, Cole attributes to digestive troubles. Michael,[6] an authority on the topic, says, "Acne vulgaris is a syndrome the cause of which is a complex of various factors. In juvenile patients the physiologic activity of the gonads appears to be the most important

[3] Christie, R. V., The Lung Volume and Its Subdivisions. I. Methods of Measurement. *J. Clin. Investig.*, 1932, **11**, 1099–1118.

[4] Schneider, E. C., A Record of Experience with Certain Physical Efficiency and Low Oxygen Tests. *Amer. J. Med. Sci.*, 1921, **161**, 397–407.

[5] Todd, T. W., *Behavior Patterns of the Alimentary Tract.* Baltimore: Williams and Wilkins, 1930. Pp. 79.

[6] Michael, J. C., Observations on the Treatment of Acne Vulgaris. *J. Amer. Med. Assoc.*, 1935, **105**, 327–331.

factor." He scarcely mentions diet *per se*. Rosenthal and Neustaedter,[7] from data on estrogenic substance in the blood of girls with acne and by literature citation, emphasize the probable relation of pimples to abnormality of formation or utilization of the sex hormone and to appearance of secondary sexual characteristics.

The discussion of the endocrines opens a very controversial subject. Some of the points presented are in agreement with present day evidence. Others, however, notably those concerning the pituitary glands and the independence which the author claims for the various glands, are in error.

The inaccuracies with respect to physical and physiological aspects of adolescence which have been pointed out would perhaps not be worth dwelling upon were their appearance limited to this book. Many of the concepts, however, have continued to be set forth as facts in reviews on adolescence for the past two or three decades even though their scientific status is as questionable now as it was when they were introduced. A chapter on physical and physiological facts of adolescence as they influence the personal and social adjustment of the individual must await further carefully controlled work.

The chapter on emotional development contains a brief description of emotion in general, of love, anger, and fear in particular, and of the part the school might take in controlling emotional development. Again the reader may get the impression that adolescence is a most trying period of life, but evidence for such is not given.

In the chapter on social development a number of pages are well spent in showing how little is known about adolescent friendships and leadership; the remainder of the chapter consists of advice to teachers on the value and function of extra-curricular activities. The general philosophy is that through extra-curricular activities practical training in citizenship is acquired. The following chapter presents a review of results of measurement for social, moral and religious attitudes. The selection and treatment of the material is about as extensive as the experimental findings justify. The results of the Character Education Inquiry, by Hartshorne and May, might have been given fuller consideration.

The chapter on intellectual development begins with a discussion of the relatively rapid growth in intelligence during adolescence. To the reviewer's knowledge, intelligence test data do not support Cole's view that a spurt occurs during adolescence. Thurstone and

[7] Rosenthal, T., and Neustaedter, T., Estrogenic Substance in the Blood of Patients with Acne. *Arch. Dermat. Syph.*, 1935, **32**, 560–562.

Ackerson,[8] in studying the mental growth curves for the Binet tests, found by a method of absolute scaling that mental growth is positively accelerated up to about eleven years and is negatively accelerated thereafter. In accounting for the assumed rise in intellectual development the writer says, "In all curves of learning one finds long plateaus covering the periods during which basic skills are being acquired. At the end of such plateaus there is usually a sudden and marked rise in learning capacity due presumably to the coördination of simple skills and not to any neurological development of the learner. This integration of experience, with childhood serving as a long plateau, is doubtless one cause of the relatively rapid intellectual development during adolescence."

Following this discussion of intellectual growth and an excursion into neurological evidence for same, the writer presents a very reasonable analysis of test limitations and the alleged time of cessation of mental growth. Then memory, imagination, organizing ability, reasoning, thinking, judging, generalizing, and special abilities are afforded superficial treatment in order to show the teacher that ". . . growth in mental power is there; it merely awaits adequate stimulation by class work. Readings that demand organization, experiments that require close reasoning, writing that calls for vivid imagination, and even assignments, properly presented, that demand memorizing, should be stressed." This advice seems to be based upon the old notion of mental faculties and their assumed susceptibility to independent training; yet the author states that such a notion is no longer the mode.

Four chapters in the book seek to inform the public school teacher of expected deviates from the normal with respect to delinquency, neurasthenia, hysteria, fanaticism, inferiority complexes, psychopathic personalities, and intellect. The emphasis, through numerous case-study illustrations and selected literature citations, is directed toward a teacher-recognition of unusual behavior so that the cases may be referred to experts for diagnosis and remedial treatment. The part the school might play in avoiding later vocational misfits is also discussed. Then the adolescent and his home, the school, and his community serve as topics for case histories and for general advice on the understanding and frequent alleviation of the hardships under which adolescents exist.

In the conclusion are given criteria of the end of adolescence,

[8] Thurstone, L. L., and Ackerson, L., The Mental Growth Curves for the Binet Tests. *J. Educ. Psychol.*, 1929, **20**, 569–583.

which is shown (1) physically—by a body which has assumed adult proportions, (2) emotionally—by reactions which are not typically adolescent, (3) socially—by easy and natural adjustment to ordinary and recurrent social situations, (4) morally—by ideals for the guide of one's own conduct and for the estimation of others, and (5) intellectually—by a mental age of at least fourteen, a position sufficiently remunerative to support one's self and dependents, and the display of reasonable prudence in the management of one's own affairs. The difficulties inherent in these criteria are conspicuous. Again it may be seen that there is no adequate philosophy for the unification of the material presented.

It is not difficult to find plausible reasons why the field of adolescence has received scant attention in the laboratories of the biological sciences. The problems of adolescence are on many counts among the most perplexing of all human phenomena; a most baffling array of investigatory difficulties is provided by the immense complexity of physical, biochemical, and behavioral features of pubescence, by cultural taboos attending the process, and by inadequate research techniques. In our present state of knowledge, books reviewing adolescence should contain only carefully weighed statements accompanied by citations of existing documentary evidence. To the reviewer, it seems that further writing of books on adolescence such as have appeared in recent years might well be postponed until more of the controversial issues of the anatomy, physiology, and biochemistry of pubescence are better understood, and above all, until the psychologist, the pediatrician, and the sociologist have developed techniques and concepts which will enable them to measure the aspects of personal and social adjustment and to relate them to the actual anatomical, physiological, and biochemical changes which occur as the individual passes from childhood to adulthood.

JOHN B. WOLFE.

University of Mississippi.

FREEMAN, ELLIS, *Social Psychology.* New York: Henry Holt and Co., 1936. Pp. xii+491.

There is a movement current among psychologists to apply their science to vital controversial issues, social and political. This newfound courage is in part due to a fear that unless they take a hand in them the controversies will be settled by default in the interests of a political reaction which might be extremely hostile to psychology. In part also the movement reflects a conviction that a science's public and its students may rightly demand of it some answer to socially

important as well as to academic problems. Professor Ellis Freeman's book is notably in line with this movement. Its interest is in "evaluating contemporary phenomena and estimating tendencies toward the future." No other recent book on social psychology can approach it in unorthodoxy of content and few are as interesting to the reader.

The index starts with A.A.A. and ends with Zoo. Between these alphabetical extremes are included such topics as the relativity of abnormal behavior to the cultural background; rationalization as exemplified by patriotic and business groups; sex relations between blacks and whites; an economic theory of race prejudice; the survival of animistic thinking evident in linguistic forms; a very self-confident discussion of the child and the primitive in relation to modern individualism; an iconoclastic analysis of the function of professional groups in modern society; socialized medicine; a treatment of the problem of impartiality in the social sciences, including art, the law, and teaching, which results in two unique and important chapters; a psychological attack upon the abstinence theory of interest and rent; a consideration of acquisitiveness; the psychology of the production line in industry; Taylorism and industrial welfare work from the point of view of the worker; a discussion of modern art, including abstraction and the relation of art to propaganda; a chapter on groups; and finally a chapter on science. The outcome is a highly original book in which several problems which have been crying for a social-psychological analysis are treated for the first time. Where the book is at its best, it might be said to be a pioneering attempt at an *applied* social psychology.

For use as a textbook it has some virtues but several important defects. It is interesting and well written, it will jolt the student into a considerable amount of reëxamination of prejudices, and it is thoroughly contemporary. On the other hand the book contains no graphs, tables, or illustrations of any sort, nor any systematic references for further reading. The only concession to textbook usage is the summarizing of chapters, which is excellent. Facts, evidence, or sources where the facts may be obtained are neglected; there is no use whatever of experimental material although it would often be relevant. The style is figurative and shows great skill at apt phrasing but many terms and concepts are introduced without definition or explanation (*e.g. epigones*). Standard psychological terms have apparently been zealously avoided. When terms are borrowed they are taken from such sources as the anthropologists, Freud, Veblen, Marx, or Pareto. Whatever the author's intentions, the book does

not give the impression of being written first and foremost for beginning students. Frequently it appears to be addressed to much more sophisticated groups.

Presumably art, medicine, and labor problems are closer to the average student's interests than theories of language and the expression of the emotions. Freeman believes it "more important to know how a whole people comes to believe that 'money talks' than to know how one person comes to laugh or cry when another is observed to do so." But this belief leads him to omit many phases of social psychology which, although undoubtedly less applicable to "life," are highly significant for the systematic development of the subject. There is no direct consideration of personality or character, social attitudes, the development of social behavior in the child, and no use of the concepts of imitation, suggestion, or sympathy.

Freeman believes that individual psychology is the only basis needed for social psychology and devotes the first part of the book to the former. But his treatment here is equally novel. He makes an interesting, if somewhat sketchy, attempt to build this individual basis out of concepts from Gestalt psychology, supplemented with anthropological and Freudian material. After first devoting 27 pages to a spirited attack on the group-mind fallacy not only as unscientific but also as a demagogic tool for destroying individual democratic liberties, he introduces the concept of value—"anything which a person desires"—which is central to his whole treatment. Not social behavior but the individual's construction of his universe is primary. In common with Gestalt psychology, it is assumed that if one gives an adequate account of the experiential side—the value—one will have given all that is necessary to explain the concomitant behavior. Since the term value can be, and is, used as the equivalent of habit, attitude, purpose, sentiment, object, stimulus, or incentive, the discussion can be carried out consistently on a basis of this one concept. But as a result it is often vague and unsatisfactory. In part, however, it is this loose conceptual framework which enables Freeman to break new ground and attempt new problems, just as the concept of social attitude provided a fresh starting-point. Professor Freeman has written a *Social Psychology* which although neither inclusive, nor factual, is important for showing what can be done in avoiding a dry and neutral approach to social problems.

JAMES J. GIBSON.

Smith College.

FRY, C. C., and HAGGARD, H. W., *The Anatomy of Personality.* New York: Harper & Brothers, 1936. Pp. xi+357.

Pointing out that chemistry failed materially to progress until its crude descriptive procedures had been replaced by accurate analyses yielding formulae in terms of basic elements, the authors of this book propose to substitute an analytical study of human beings for purely descriptive accounts. Theophrastus' verbal picture of the 'impure man,' written more than two milleniums ago, is introduced as an example of the earlier descriptive procedures. When the authors reduce this lengthy account to modern terms, they discover that the impure man possesses "a personality with a strong impulse, a cold, but active temperament, and marked egocentricity." If the reader protests that *physique, impulse, intelligence, temperament,* and *ego* (which prove to be the authors' basic elements of personality) are somewhat less firmly rooted than the periodic table of chemical elements, he does so at his own risk, for the authors make no such suggestion. If he ventures to inquire whether designating a temperament as cold or warm is the exact analog of discovering experimentally the subscripts in a chemical formula, the responsibility is entirely his own. And finally, if he is unable to comprehend why the study of personality according to this schema is any more analytical than the techniques of Theophrastus, this must be attributed to an inborn lack of the third element of personality in his make-up.

Disregarding such adventitious criticisms, we find the foundation of the book in its concepts of personality and character. We learn at once that "personality, the basis of human behavior, is inborn . . . the basic traits of personality . . . are as fixed and permanent throughout life as are physical peculiarities . . . the basic qualities of personality are inborn, unchanging . . . they are the same in any environment, in all environments." *Character,* on the other hand, is "a product resulting from the action of environment upon the personality." It is reassuring to learn that physique, impulse, intelligence, temperament and ego exist in fixed and permanent form, unaffected by the vagaries of metabolism, by the derangement of endocrine balance, and by the *Sturm und Drang* of daily living. Certain contemporary psychologists have been guilty of suggesting that the stream of experience continually alters either all or some fraction of man's total make-up. No such conception mars the authors' presentation of a fixed and unchanging personality, which, in coöperation with environment, moulds a "character [which] lies

between the personality and the environment and therefore is influenced by both."

After disposing of these general topics in a chapter entitled "The Manners of All Men" (but which, by some Freudian slip, we suppose, deals chiefly with 'The Impure Man'), the authors consider in order each of the basic elements of personality. Facing the problem of *physique* (as "Realities That Lie in the Flesh"), the authors point out that "there is no rule of thumb in measuring men, no short cut to the understanding of personality"; but hasten to add that "we can not escape the stubborn fact that some relation does exist" between personality and physique. This relation, it appears, is best expressed in terms of Kretschmer's classification, which seems to have lost its last vestige of uncertainty and to have become completely unequivocal. Thus, instead of being confronted with a tentative proposal of crude categories based upon a pitifully small number of cases, we are reassured to learn that "a man who is of pyknic physique has those qualities of personality which in heightened degree characterize the manic-depressive; the man who is of leptosomic physique has those qualities which characterize schizophrenia." No saving clauses, no qualifications, only a universal principle; apparently the authors have found the short cut whose existence they doubted earlier in the chapter. This impression finds confirmation in their statement that "observation of men in public life will show that *in the great majority of cases* the correlation between physique and the natural tendencies of the personality is borne out." (Italics mine.)

Under "Freedom That Grows with the Mind," we are told of impulse—phylogenetically the first element of personality. Temperament comes next in the race; not without amazement we learn that "temperament is controlled by the thalamus" at which point "the impulse in going outward becomes surrounded by and imbued with emotional qualities." Who would have thought it was as simple as that? Nor do other problems present greater difficulty. A recent writer of a textbook on experimental social psychology devotes many pages to a review of investigations regarding the effect of environment and training upon intelligence test scores. Perhaps he failed to realize that intelligence "is wholly an hereditary quality . . . no amount of education will increase—and fortunately neither decrease intelligence." Yet the authors are surely dealing with intelligence as measured by current tests for they state that "intelli-

gence is the one quality of personality that can be measured with reasonable precision" by "tests [which] have been developed for this purpose." (One wonders, incidentally, about the analogy to chemical analysis, if only one of five elements can be measured "with reasonable precision.") Perhaps the evidence on environmental effects may be ignored because of the important discovery that intelligence "follows closely the so-called Mendelian law of inheritance."

There is no need to go into further detail, although one is tempted by the seductive chapter headings in the latter half of the book. The tenor of the earlier chapters is maintained throughout the later portions of the volume. Proclamation supplants evidence at every point; controversy and uncertainty are avoided by simple dogmatism. There are no footnote references to existing investigations. The reader is left to assume from the lack of documentation that such is unnecessary and that the study of human personalities is as well stabilized as the science of chemistry to which it has been compared.

The literary style of the book is always urbane, fluent, and lucid; the text sparkles with epigrams. The typography is excellent and the illustrations from Theophrastus' book of characters lend a pungent flavor to the text. Case material abounds and it is presented in a fashion which drives the reader on to the last chapter without rest and without a dull moment. One lays aside the book with genuine envy for its literary merits and for its bold and unhesitating excursion into a field where others have ventured only timorously. Because of these qualities, it is a book which one will recommend to one's professional friends as a stimulating companion for leisure hours, but which one will regret to see in the hands of the general public.

JOHN G. JENKINS.

Cornell University.

DOCKERAY, FLOYD C., *General Psychology, Revised Edition.* New York: Prentice-Hall, Inc., 1935. Pp. xxix+576.

With numerous new texts on the market, it is a satisfaction to take up this revised introductory text by Professor Dockeray of Ohio State University. For years Dr. Dockeray has supervised the general course at Ohio which has been taught in sections by numerous members of the staff and attended probably, at one time, by the largest group of students in any single institution in the world. Since 1930 he has also been chairman of the Joint Committee of Fifteen of

the Midwestern and Southern Psychological Associations, which has had under consideration the objectives, methods and contents of the first course in psychology. The instructor is thus assured that this text has had an unusual background of preliminary tryout and thoughtful adaptation to the needs of the general student who is not expecting to be a professional psychologist but whom the author "hopes to make cognizant of psychological problems that cannot be escaped in the social adjustments in and out of college." The author retains his genetic viewpoint throughout, emphasizing the nature of the human organism in its evolutionary and developmental relations. While presenting the stimulus-response mechanisms he does not neglect to stress the importance of the individual as a prominent factor in determining his own behavior. The revised edition recognizes the importance of the Gestalt viewpoint when it is most significant without departing from an eclectic treatment of the subject. As with most modern texts it emphasizes the objective method and cultivates a scientific attitude toward human behavior.

The revised edition has been made more teachable by thirty-two short chapters grouped into eleven sections. After an introductory chapter on How to Study, these sections take up the Scientific Point of View, the Evolutionary Point of View, Types of Simple Behavior, Motivation of Behavior, Organized Behavior, Disorganized Response, Sensory Discrimination, Human and Animal Learning, Higher Types of Mental Activity, Levels of Attainment, and Social Adjustment. The contrast is brought out between organized behavior, represented in observation and the attentive postures of efficiency, and the disorganized responses of the emotions. This has much to commend it in training students to adjust themselves to everyday situations. The chapters on the motivation of behavior, covering the physiological conditions and the development of conflicts and motives, embrace one of the finest common-sense treatments to be found in any introductory text. When brought together with the chapters on social behavior and personality, the student must feel that he has been brought into contact with man-to-man problems as well as with the real scientist.

Those who believe that sensation should occupy a large part of psychology for beginning students because more work has been done in that field, may be disappointed to find only fifty pages devoted to this topic including spatial discriminations. This shows, however, that the author never loses sight of the main purpose of the course

to make it function in the lives of the student since this is the only contact with psychology which most of them will ever have.

In the chapters on learning and higher types of problem solving and reasoning, as well as throughout the book, adequate experimental evidence is constantly included so that the student will at least indirectly acquire an appreciation of the scientific approach to the study of the adjustment of the individual to his environment and the formulation of laws of behavior.

The author apparently believes that psychology should be put in its scientific background with the introductory student. He therefore devotes unusual attention early in the text to the evolutionary point of view, the origin of man and the evolution of the nervous system. This treatment of the human nervous system, however, is simple and clear; the combination of this genetic approach with experimental evidence and the relation of response to stimulus patterns gives the student a broad basis for his psychological thinking.

Perhaps the outstanding feature of this *General Psychology* is the plan by which the author endeavors to keep the student constantly thinking about his own activities through concrete examples taken from the settings with which the students are familiar. If this book is used as a text a teacher should find no difficulty in making the study alive for the students. The technical dryness which is altogether too common in beginning texts is happily absent. The questions for reviewing each chapter and the specific references, illustrations, index, and format are excellently adapted to a beginning text which no psychologist need feel slights the fundamental aspects of his subject.

Various fashions for presenting the material of a beginning course have, from time to time, been in vogue. Whether it is better to start with the total response of the organism and analyze later into the simple responses or to proceed from the simple to the complex is still a matter for empirical determination. Those who like to begin with the nervous system and the sense organs will find that this text would interfere with their pet plan of organization. The text, however, seems to reach a fair compromise by placing the emphasis upon the development of responses and the adjustment of the organism as a whole. In general, it may be said that Dr. Dockeray has provided a systematic view of the subject without riding a hobby or doing harm to a natural method of orientation in the field.

J. B. MINER.

University of Kentucky.

JASTROW, JOSEPH, *Sanity First, The Art of Sensible Living.* New York: Greenberg, 1935. Pp. viii+312.

This volume, based largely on a series of radio talks delivered by the author under the title "Herald of Sanity," is primarily a layman's book on mental hygiene, although it includes a considerable amount of elementary general psychology. It differs from most popular books on psychology in that the discussion is essentially compatible with scientific psychology and it is unlike most textbooks in that the terminology employed is largely that used by the layman. Beginning with a chapter on human endowment, the author proceeds with a discussion of mental conflict and adjustment which should answer satisfactorily most of the many questions raised by the lay reader.

This book should be of interest to the professional psychologist for three reasons. (1) It seems to be ideally suited to lend or recommend to the average person who wants to read "a book on psychology." Because of this, it is unfortunate that the word "psychology" does not appear in the title of the book. (2) While not in any sense a textbook, it might well be used as collateral reading for the beginning student in that it would serve to bridge the gap between what he thinks psychology is and what he finds it to be in the elementary course. It also contains an excellent exposé of astrology, numerology, graphology, and other varieties of pseudo-psychology. (3) It should serve to remind teachers of psychology that their subject-matter can be presented in an attractive manner without sacrificing its scientific character.

As intimated above, the scientific psychologist will find little to quarrel about in this popular presentation. He may object to the rather free use of popular phrases such as "mass mind" and "herd instinct," but further reading will reveal that the author is very careful to delimit and correctly interpret the popular terms which he uses. Objection may also be made to the somewhat inspirational style, but here it must be remembered for whom the book was written and the sort of writings with which it must compete if it is to be widely read. The author has rendered both psychology and the reading public a real service by preparing this interesting but sound presentation of a popular subject.

E. LOWELL KELLY.

Connecticut State College.

BOOKS RECEIVED

Arbeiten aus dem Psychologischen Institut der Universität München (Bd. 6), 1935.

CACERES, ALFREDO, *La obra psicologica de Radicki, 1910–1935.* Montevideo, Uruguay: La Sociedad de Estudios Psicologicos, 1935. Pp. 119.

FERNBERGER, S. W., *Elementary General Psychology.* New York: F. S. Crofts and Company, 1936. Pp. 436.

FRYER, DOUGLAS, and HENRY, EDWIN, *An Outline of General Psychology.* New York: Barnes and Noble, 1936. Pp. 229+xliii.

FREEMAN, E., *Social Psychology.* New York: Henry Holt and Company, 1936. Pp. xii+491.

FRY, C. C., and HAGGARD, H. W., *The Anatomy of Personality.* New York: Harper and Brothers, 1936. Pp. xi+357.

GALLI, ETTORE, *L'estetica e i suoi problemi.* Naples: Casa Editrice Rondinella Alfredo, 1935. Pp. 391.

GARRISON, S. C., and GARRISON, K. C., *Fundamentals of Psychology in Secondary Education.* New York: Prentice-Hall, Inc., 1936. Pp. vii+599.

GURNEE, HERBERT, *Elements of Social Psychology.* New York: Farrar and Rinehart, Inc., 1936. Pp. xi+467.

HIGGINSON, GLENN D., *Psychology.* New York: The Macmillan Company, 1936. Pp. xiii+646.

HOLMES, S. J., *Human Genetics and Its Social Import.* New York: McGraw-Hill Book Company, 1936. Pp. 385.

JANET, PIERRE, *L'intelligence avant le langage.* Paris: Ernest Flammarion, 26 Rue Racine, 1936. Pp. 292.

JONES, VERNON, *Character and Citizenship Training in the Public School.* Chicago: University of Chicago Press, 1936. Pp. xi+404.

KLEIN, DAVID B., *General Psychology.* New York: Henry Holt and Company, 1936. Pp. 546.

LAPIERE, RICHARD, and FARNSWORTH, PAUL, *Social Psychology.* New York: McGraw-Hill Book Company, 1936. Pp. 484.

LEWIN, KURT, *Principles of Topological Psychology.* New York: The McGraw-Hill Book Company, 1936. Pp. 205.

MARINESCO, G., and KREINDLER, A., *Des réflexes conditionnels.* Paris: Félix Alcan, 108 Boulevard St.-Germain, 1935. Pp. vii+171.

MEAD, GEORGE H., *Movements of Thought in the Nineteenth Century.* Chicago: University of Chicago Press, 1936. Pp. xxxix+519.

MELTON, ARTHUR W., FELDMAN, NITA GOLDBERG, and MASON, CHARLES W., *Experimental Studies of the Education of Children in a Museum of Science.* Washington: The American Association of Museums, 1936. Pp. vi+106.

MOTTIER, G., *Le phénomène de l'art.* Paris: Boivin et Cie, 5 Rue Palatine, 1936. Pp. 237.

RUCKMICK, C. A., *The Psychology of Feeling and Emotion.* New York: McGraw-Hill Book Company, 1936. Pp. xiii+529.

SADLER, WILLIAM S., *Theory and Practice of Psychiatry.* St. Louis: The C. V. Mosby Company, 1936. Pp. 1155.

SCHWARZ, OSIAS L., *Unconventional Ethics.* Washington: Perennial Publications, 1936. Pp. 266.

SEASHORE, CARL E., *Psychology of the Vibrato in Voice and Instrument.* University of Iowa Studies, Studies in the Psychology of Music, Vol. III. Iowa City: University of Iowa, 1936. Pp. 159.

SMYTH, NATHAN A., *Through Science to God.* New York: The Macmillan Company, 1936. Pp. vi+213.

STUDEBAKER, JOHN W., *Plain Talk.* Washington: National Home Library Foundation, 1936. Pp. 166.

WARDEN, CARL J., *The Emergence of Human Culture.* New York: The Macmillan Company, 1936. Pp. 189.

WARDEN, CARL J., JENKINS, THOMAS N., and WARNER, LUCIEN H., *Comparative Psychology Vertebrates.* New York: The Ronald Press Company, 1936. Pp. x+560.

WASHBURN, MARGARET F., *The Animal Mind* (Fourth Edition). New York: The Macmillan Company, 1936. Pp. 419.

NOTES AND NEWS

THE meetings of Section I (Psychology) will be held in Atlantic City at the Hotel Chelsea from Monday, December 28, to Wednesday, December 30. In addition to the regular program of submitted papers, there will be a symposium on the general topic of physiological psychology. At a joint banquet of Sections I and Q (Education), the vice-presidents of the sections will give their vice-presidential addresses.

Abstracts submitted by the members and fellows of Section I should reach the secretary, John A. McGeoch, Department of Psychology, Wesleyan University, Middletown, Connecticut, by November 6. Since individual calls for papers are not to be sent to each member of the section, especial attention to and general dissemination of this notice is requested.

AT THE commencement of the University of Pittsburgh on June 10 the degree of doctor of science was conferred on Dr. Karl S. Lashley, professor of psychology at Harvard University.—*Science.*